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THE AUTOMOBILE AS A PUBLIC HEALTH HAZARD

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Presidential Address delivered before the Conference of State and Provincial Health Authorities of North America, Lansing, Michigan, June 16, 1924.

THE GREAT benefits of the automobile are beyond description, for their full extent is not yet realized. However, some harmful effects of the automobile have forced themselves into public notice. Mortality records everywhere show marked, rapid and mounting increase in the number of deaths due to automobile accidents. And the fact that the census charges the death to the heavier moving vehicle should be kept in mind, especially in railroad crossing accidents.

Aside from the violent deaths, an increase is seen in fatalities from carbon monoxide poisoning from automobile exhaust gases. Recently a new danger from automobile exhaust has been described. It is said that by the addition to ordinary gasoline of a small amount of a certain proprietary chemical preparation containing lead, the mileage per gallon can be increased and engine trouble obviated. But the readily absorbed oxide and chloride of lead liable to cumulative effect in the body will be discharged in the exhaust, and if this preparation comes into general use, a new automobile hazard will be introduced.

Automobile manufacturing plants as a rule operate under intelligent regulations for protection against industrial health hazards, but garages rarely pay any attention to such risks. Workers in battery factories and repair shops are often exposed to conditions that make serious lead poisoning almost inevitable.

True, at present only few state health departments have jurisdiction in matters of industrial hygiene. As a rule, the importance of the medical side of industrial hygiene is not understood by lawmakers, and the necessary appropriation for properly trained workers and laboratories is not granted. Therefore, health authorities should investigate these problems, interpret the mortality statistics and emphasize the health hazards of industry.

Dr. Haven Emerson, in a paper read before the Section on Preventive Medicine of the American Medical Association in Chicago June 13, pointed out another automobile hazard. He stated that people whose work, age and social position naturally lead to habits which reduce physical exertion to a minimum are riding when they should walk, thus increasing the tendency to diabetes.

Dr. Fulton said in his presidential address to the Conference in 1905: "The

four great plagues which have driven the nations together in sanitary conferences are typhus, cholera, plague, and yellow fever. With the first of these, typhus, America long ago ceased to be concerned. With cholera and plague the United States has not been seriously threatened in forty years. Since 1901, our interest in yellow fever has consisted wholly in the propagation at home and abroad of that knowledge which we ourselves demonstrated as all-sufficient for the extinction of yellow fever wherever in the world enlightened governments exist.

"With the construction of a scientific basis of preventive medicine, and with the simplification of defensive methods, the health of nations has no such hazard in the course of trade as was the case fifteen or twenty years ago. The world's trade now proceeds on the credit of nations, and the last vestige of distrust will disappear when quarantine regulations are conformed to modern knowledge concerning the propagation of disease. The justifying ground of necessity has slipped from under nearly all those extraordinary powers by which sanitary authorities formerly tried to exclude exotic diseases.

"Much of our expensive armament is now useless, and may as well go to pot. Means and energies are released for employment on near-at-hand problems. We have lost our emergencies and found our routine. What we want is not a harnessed and bulwarked safety, but the light weapons which suffice against the dangers of these times. In sanitation, as in business, we must get credit proportionate to the stability and efficiency of our sanitary institutions; and similar credit, measured by similar standards, we must extend to those from whom we expect credit. In the family of nations, not one has more to gain than the United States in mitigating as rapidly as scientific progress allows the restrictions upon trade. We must know our neighbors well, and must be by them well known."

Now a fifth driving force, the automobile, brings nations together in sanitary conference. Millions of people now travel by automobile to the remotest parts of this continent reached by roads. Disease control always has been inseparable from travel. The great plagues have moved from place to place as infected people moved. Until recently control measures of proven value could be used quite effectively to prevent the introduction of infectious diseases into new territory, but with universal automobile traffic new measures and methods must be devised and applied in daily public health practice.

The nature of this problem must be considered before its solution can be worked out, and I will use Minnesota because of its central location on this continent to illustrate certain phases of the problem.

Last year over 500,000 automobile tourists visited Minnesota. Thousands of men and women and boys and girls who do not prepare food at home now do so on automobile tours, camping wherever night finds them. Where public tourist camps exist the tourists usually use them. Last year there were about 175 tourist camps in Minnesota. These camps are scattered over practically the entire state, chiefly along the trunk highways and located on government, state, municipal and private property. Although the State Board of Health was authorized by law in 1923 to make regulations to govern sanitary conditions of tourist camps, no appropriation was granted, and the investigation of camps, the enforcement of regulations, and general sanitary supervision remain the duty of local boards of health. Results are not satisfactory because many camps are under township boards of health, or medical health officers of cities or villages without training in camp sanitation or facilities for sanitary examinations.

The measures required to safeguard the tourist and the communities where tourist camps are located are well known, yet the problem as a whole is not simple. It involves:

1. An intelligent understanding of the situation by the people.
2. The coöperation of state and local authorities and the support of official and voluntary organizations.
3. The fixing of responsibility and the maintenance of sanitary standards.

There are two sanitary provisions absolutely necessary to a properly constructed tourist camp. They are:

1. Safe water supply.
2. Proper disposal of sewage, human excreta, garbage and other wastes.

Many camps lack both and are a menace to the health and business interests of the state.

The chief disease dangers of tourist camps and resorts, at least in Minnesota, are typhoid fever, diarrhea, and dysentery. The possibilities of trouble are suggested by the following facts: Since 1912 the Division of Preventable Diseases of the Minnesota State Board of Health has traced the infection of 438 cases of typhoid fever in Minnesota to outside sources as follows:

383 cases to 31 other states
4 cases to Mississippi boats
27 cases to Great Lakes boats
21 cases to 4 Canadian provinces
3 cases to European countries

Minnesota can be reached by automobile from any part of the United States or Canada within ten to twenty-one days, the incubation period of typhoid fever. This makes it possible for a person infected outside of the state to reach Minnesota from any part of the country before becoming sick with the disease.

The possibility of stream and lake pollution and carriage of infection to food by flies through improper disposal of human excreta is considerable, because typhoid cannot be diagnosed at its onset and the germs are excreted from its beginning.

Typhoid prevalance is now low in Minnesota; so the possibility of danger to the tourist from local typhoid infection is not large. The Division of Preventive Diseases has under supervision 115 typhoid carriers discovered in epidemiological investigation of typhoid outbreaks. To these carriers were traced 551 cases including 38 deaths. These known carriers are not dangerous while they follow the directions of the State Board of Health.

It is the unknown carriers who are dangerous, especially those who cook or handle food for others. And here the automobile tourist, who does not cook at home but does prepare food for others when touring, may be found to be a dangerous carrier. It is estimated that between one and four per cent of all persons who recover from typhoid fever remain chronic carriers, which makes it certain that there are many unidentified carriers in the great automobile tourist army. We cannot rely on the use of typhoid vaccine for tourist protection nor upon tourists boiling or treating unsafe water before use. Practical methods suitable to the means at hand must be developed to insure safety.

Now it is not my purpose to carry this discussion of the automobile tourist problem further, although at this moment smallpox is a serious menace, and venereal diseases, always difficult to control, must be considered in relation to health hazards of the automobile. All these matters should be fully discussed when the report of the Committee on Tourists, Vacations, and Resorts is made.

I wish to emphasize that the automobile health hazards are not confined to tourists. Automobile traffic of all kinds, buses, trucks and private machines, must be studied in its various relations to health, and this study should be carried on constantly, for new dangers may be discovered, possibly confined to certain sections of the country, possibly universal, which may require new measures and new methods of administrative control.

At present the bus traffic across state lines is enormous, and as good roads are provided it is sure to multiply. Disease can travel as fast as people. Control

measures cannot be successful if limited by the lines between states and provinces; nor should different procedures be used for the same purposes on either side of these imaginary lines. This sanitary problem of rapid transportation in which the automobile is the most important factor as a health hazard must be solved. The coöperation of all official health agencies in the Dominion of Canada and the United States is taken for granted, but there are other organizations whose interest and aid must be secured to make our official efforts effective. The United States Public Health Service and the Dominion Health Service in coöperation with the State and Provincial Health Authorities should enlist such allies at once.

One important organization is The National Highway Association of America, with headquarters at Washington, D. C. This Association has a board of directors numbering 100,000 or more, and its influence extends wherever automobiles travel highways on this continent.

ANTHRAX—A CONTINUING AND PROBABLY INCREASING HAZARD OF INDUSTRY

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IN A PAPER written in the fall of 1920 the author stated that "the question of the danger of anthrax infection in industry from the handling of hides, skins, wool and hair is one of increasing importance in this country,"[1] and this has been emphasized in a series of papers since published.[2, 3, 4, 5, 6]

The purpose of the present paper is to bring up to date the anthrax morbidity and mortality statistics as far as they have been obtainable, and again to emphasize the continuing and probably increasing risk from this disease both in industry and in agriculture. It is also desired to point out again the inadequacy of present methods of disinfection employed in this country and to show the desirability of further study of the question of the disinfection of hides and skins.

The Bureau of Census Mortality Statistics lists anthrax deaths (but not cases) by states, and divides them into two classes, rural and city, as given in Table I.

This table shows an apparent decline in cases from the peak of 62 in 1917 to 32 in 1921, especially in cities; but this is in reality less than indicated. Modern methods of treatment and earlier diagnosis have materially lowered anthrax mortality in the more settled regions and especially in industry. Therefore, a declining death rate does not necessarily indicate a decrease in case rate. This decline in mortality is clearly shown in the statistics of cases and deaths in industry in Pennsylvania from 1910 to July 1, 1924, which indicate an average fatality of 33 per cent

TABLE I[7]

ANTHRAX DEATHS IN REGISTRATION AREA

Year	Total	City	Rural	Number of States reporting anthrax deaths
1912	18	11	7	8
1913	25	12	13	11
1914	19	14	5	9
1915	35	20	15	35
1916	28	18	10	9
1917	62	43	19	17
1918	43	21	22	15
1919	45	28	17	19
1920	39	23	16	15
1921	32	18	14	17
1922	40	—	—	—

from 1910 to 1920 and of 7.5 per cent from 1921 to 1924.

TABLE II

INDUSTRIAL ANTHRAX (5 STATES AND NEW YORK CITY REPORTING)

Year	Cases	Deaths	
1919	43	3	13+%
1920	51	10	
1921	14	0	
1922	24	2	6+%
1923	24	2	
1924 (6 mo.)	16	1	

Table II further illustrates this point. It gives the total cases and deaths from industrial anthrax in five states (Pennsylvania, Massachusetts, Illinois, Connecticut, Minnesota) from 1919 to 1924, and shows a fatality rate of 20 per cent for 1919 and 1920 combined, and of 6 per cent for 1921 to 1924. New York City cases are also included in this table.

By far the greatest source of anthrax in this country, as well as in European countries, is the leather industry and 1921 and 1922 were years of great depression in this industry. The great majority of cattle hide tanneries in this country are packer owned or controlled, and during these years of depression the packers could supply almost all the demand for hides from healthy beef cattle killed under government inspection. When the author was taking part in a survey of tanneries in Pennsylvania in the summer and fall of 1921 only about two-thirds of the tanneries in this, the greatest tannery state in the country, were operating. With improvement in the tanning industry and increasing demands for leather the tanneries must again more freely use foreign hides, not from packer-killed stock, and so be more liable to anthrax infection.

Owing to the strict government regulations as to the disposal of the carcases of animals dying from infectious diseases, domestic hides have as yet been almost a negligible factor in industrial anthrax. With the spread of anthrax in the United States, however, this may eventually cease to be the case. Not every case of animal anthrax is recognized before death and, as previously shown,[1] some anthrax infected hides have inadvertently entered industry. With increasing cases among domestic live stock this will happen more frequently. The prevalence of anthrax among cattle in this country and the importance of this source of infection for man is indicated in Table III, which shows animal contact to be the third most frequent source of human infection, greater than the wool and hair industries combined. These figures are compiled from answers received from state registrars of those states reporting anthrax deaths in five or more years since 1912. However, a number of these states have no records as to source of infection and their reports are admittedly incomplete.

Shaving brush anthrax, so widely spread and justly feared and guarded against, appears in Table III to be of distinctly less importance in the general anthrax morbidity, though leading the list in New York City.[12] The location of the lesions on the face make the individual

TABLE III

Source of infection	1919	1920	1921	1922	1923	1924 6 mo.	Total for Source
Leather Industry	33	41	12	16	18	10	130
Wool Industry	5	2			1	2	10
Hair and Brush Industry	5	13	1	8	3	4	34
Animal Contact, direct and indirect	2	10	7	4	9	10	42
Shaving Brush Infection	10	11	12	7	4	3	47
Source not Stated	28	27	39	47	33	10	184
Total	83	104	71	82	68	39	447
States reporting cases only	7	8	7	6	8	3	
States reporting causes of infection	5	7	8	9	7	7	
Total States	12	15	15	15	15	10	

(Michigan report received after table was compiled.)

case a greater menace to life than the average industrial case, with the exception of pulmonary anthrax from dust inhalations, which seems to be very rare in this country.

California reports fourteen cases from animal contact in the past five years, Kansas two cases this year from punctured foot wounds, evidently indicating soil infection, and Louisiana reports eighteen cases traceable to animal infection in the last five and a half years. This spring Louisiana lost over 20,000 cattle from anthrax in 43 of the 64 parishes of the state, entailing an estimated financial loss of about $1,500,000.[8] This was associated with eight cases of human anthrax in one month, six of them surely traceable to animal sources. In May, 1924, there was a localized anthrax epidemic on a dairy farm in Maryland resulting in the death of eight cattle, but fortunately with no human contact cases.[9] This epidemic was traced to blood and bone meal fertilizer obtained from Baltimore and mixed with the cattle feed. The blood tankage came from some southern source, purely domestic.

Goat skin tanneries, the majority of which are in the Philadelphia district, receive practically all of their skins from abroad, many of them from countries known to be anthrax infested. During seasons of depression buyers can be more careful to eliminate stock likely to be infected; but as conditions improve they buy with less care and are more likely to take dangerous materials. It has been clearly shown in the papers previously referred to that the government regulations intended to guard against the importation of anthrax infected skins, hides, and hair [10] do not accomplish the purpose, and that permitted so-called "disinfection" methods are woefully inadequate.

As pointed out by Dr. H. Leymann in his report to the International Labor Office, presented to the Advisory Committee on Industrial Hygiene meeting in Geneva in September, 1923,[11] similar conditions exist in Germany, and German statistics show a tremendous drop in industrial anthrax during the war, due to complete stoppage of hide and skin importation, and a beginning increase in 1920 and 1921. See Table IV.

TABLE IV

ANTHRAX CASES AMONG TANNERY WORKERS, ETC., IN GERMANY

Year	Cases Non-fatal	Cases Fatal	Total
1910	247	40	287
1911	248	40	288
1912	238	36	274
1913	191	33	224
1914	162	40	202
1915	53	14	67
1916	31	6	37
1917	23	11	34
1918	22	7	29
1919	16	2	18
1920	26	9	35
1921	69	11	80

Table V summarizes the anthrax cases and deaths reported from 15 states responding to the author's inquiries, and includes all cases reported, regardless of source. It would give an average of 80 cases per year from 1919 to 1923 for the 15 states—over 5 per state per year—and 39 for the first half of 1924 for 9 states—or a rate of over 8 per state per year—a very definite increase and an indication that anthrax as a public health and industrial menace is far from negligible and probably on the increase.

Tables II and III show very clearly the effect of the industrial depression, indicated above, as a marked decrease in industrial anthrax in 1921, less marked in 1922, with renewed severity of the hazard in 1923, and an even greater increase in the first half of 1924. The author is confident that fluctuations in the incidence of industrial anthrax have been due to fluctuations in importations of infected materials rather than to any disinfection procedures or regulations, and that they will continue to be so until more satisfactory disinfection methods are put into general practice.

The Bureau of Animal Industry [10] only requires disinfection of imported materials from countries where anthrax is known to be endemic (as it is in Mexico,

TABLE V

ANTHRAX CASES AND DEATHS REPORTED IN 15 STATES

State	1919		1920		1921		1922		1923		1924[1]		Total		% mortality	Number of years covered
	Cases	Deaths	CC	D	C	D	C	D	C	D	C	D	C	D		
Pa.	15	1	20	3	8	5	18	0	22	2	19	2	102	13	12+	5½
Mass.	22	2	13	4	6	0	3	1	7	2	3	1	54	10	18+	5½
Cal.	14	1	8	1	7	1	5	2	14	4	2	0	50	9	18	5½
La.	3	3	8	4	6	2	4	1	4	0	8	2	33	11	33+	5½
N. Y.[2]	14	9	24	3	9	6	8	2	6	2	—	—	61	22	36+	5
Md.[3]			—	—	16		18	1	7		—	—	41	1	2+	3
Ill.	2	2	9	4	7	3	4	4	1	1	1	0	24	14	58+	5½
N. J.[4]			5		0		11		2		3		21			5
Ohio	2	2	0	0	4	4	3	3	2	0	—	—	11	9	81+	5
Wis.	3	0	2	0	1	0	2	1	1	0	1	1	10	2	20	5½
Minn.	2	1	7	3	1	1	0	0	0	0	—	—	10	5	50	5
Col.	3	2	1	1	2	0	1	1	1	0	—	—	8	4	50	5
Conn.	1	0	1	1	0	0	3	0	0	0	0	0	5	1	20	5½
Kan.	0	0	1		2	1	0	0	0	0	2	2	5	3	60	5½
Va.	0	0	0	0	1	1	2	2	1	0	—	—	4	3	75	5
Total	81	23	99	24	70	24	82	18	68	11	39	8	439	107		
% fatal		28+		24+		34+		22		16+		20+		24+		

C—cases. D—deaths.

[1] Six months.

[2] State Dept. of Labor report admittedly incomplete, but N. Y. City report accurate.

[3] Only deaths from shaving brush cases mentioned.

[4] Report from June 30 to June 30, only cases reported, not deaths.

[5] Table compiled from reports received from state registrars, health officers or depts. of labor. Also from 1921 Mortality Statistics.

South America, Arabia, India, China and Siberia) when they are not accompanied by a consular certificate, which have been shown often to be valueless. Hair and wool without such certificate are to be "disinfected" by exposure to 165°F, as stated in joint order No. 2; or to 200°F for at least 15 minutes, as now recommended by inspectors; or by soaking in boiling water and hot alkaline suds, also now recommended. The former will not kill anthrax spores. The latter may, if properly carried out; but as interpreted and practiced in Philadelphia horse hair dressing shops, it certainly will not. However, any of the regulations for hair disinfection adopted by New York,[13] Pennsylvania,[14] and Connecticut,[15] will kill anthrax spores if properly carried out. To be efficient they must be practiced under rigid inspection, at least in the smaller shops, and the anthrax cases continuing to be reported in the hair industry (see Table III) show that this is not done.

England has apparently solved the problem of wool and hair disinfection by the use of hot alkaline suds followed by hot 2 per cent formaldehyde solution, and then by storage in a holding room. This is done in modified wool scouring machines at a government disinfecting station under expert supervision at a minimum cost to the importer. Sir Dilworth Duckering, who is in charge of the experimental plant at Liverpool, informed me last fall that it was apparently proving satisfactory. A central coöperative, state or government plant is the only safe and sure means of disinfecting raw wool and undressed hair, as the small dressers and spinners will not and cannot carry out proper methods.

Hides suspected of containing anthrax spores are permitted to be soaked in 1-1000 bichloride of mercury for 12 hours (plain water would be almost as good). Goat skins are permitted to be soaked in a milk of lime, 15 pounds per 100 gallons of water, for 12 hours. This makes at best less than a 2 per cent CaO mixture, and virulent anthrax has been recovered from goat skin after soaking for 17 days in 5 per cent CaO.[4]

The Bureau of Animal Industry recommends two other disinfecting procedures for hides and skins; but they are more complicated, time consuming, and expen-

sive, and tanners will not use them so long as the first methods are permitted. One method, that of Seymour Jones,[16] cannot be used in the tannery, and the other, the Schattenfroh method,[17] requires especial care to keep from spoiling the skins. It is used routinely, however, with good results in some parts of Europe, but the American tanners claim that they cannot make good leather with skins so treated.

The question of skin and hide disinfection is a very live one in Europe, and in September, 1923, it was the subject of a special meeting of the International Advisory Committee on Industrial Hygiene of the International Labor Bureau. The author and his colleague, Dr. E. F. Pike of the Chemical Department of the University of Pennsylvania, addressed this meeting by special invitation. After free discussion, this committee decided that three methods presented to it gave sufficient promise to be investigated further; the Schattenfroh salt and hydrochloric acid method, above referred to, the salt and alkali method presented by Dr. Leymann, Ministerial Councillor of Labor, Berlin,[11] and the iodin methods reported by Drs. Smyth and Pike.[6] The second method is being used experimentally in Germany, but is not yet fully adopted, and as far as we know has never been tried in America. The iodin method has not yet been carried beyond the laboratory stage on separate goat skins.

In selecting a method for disinfection of hides, two very important factors must not be overlooked—economy, and lack of injury to the skins. At the present cost of iodin, its use is prohibitive, but there is a strong probability [18] that a few years will see this very much lowered so as to make its use feasible. The salt and alkali method is recommended for use at the tannery only, but iodin could be used easily at a central plant or at an export port.

In closing, it is desired to make a strong plea for further study of these three methods on a manufacturing scale, with comparisons of efficiency, facility and cost, and for a free discussion of the advisability of eventually handling the entire problem of the disinfection of raw materials for anthrax in a central scientifically controlled disinfecting station, or stations, either cooperatively managed, or state or government controlled. Central stations would almost entirely remove the hazard for industry and, if at ports of entry, also from railroad handling and trucking. At export ports steamship lines would also be protected. The hazard of handling infected materials would be confined to comparatively few employes who could be scientifically protected and under constant expert supervision, and disinfection would be much surer and more uniform than it will ever be in individual industrial plants. With the establishment of reliable, dependable methods, disinfection at the export ports under international supervision, as pleaded for by Great Britain, would be the best solution until such time, many years off as yet, when the spread of trained veterinary inspection and supervision in all lands will finally put an end to anthrax as a hazard of commerce and industry.

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SANITATION PROBLEMS IN RESORTS AND TOURIST CAMPS

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Read before the Sanitary Engineering Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 23, 1924.

SANITATION in summer resorts first received serious consideration by the Michigan Department of Health in 1913. At that time an inspector was detailed and 77 resorts were visited. Scarcity of funds prevented a continuance of the work in the following two years. In 1916 the work was resumed and 173 resorts in 29 counties were inspected. In 1917 one man was detailed to carry on the work but war conditions prevented further work in the succeeding years.

The rapid strides in automobile traffic and the organizing of resort and tourist associations caused a constantly increasing resort population, and naturally the sanitation problems increased in proportion. In 1920 it was estimated that the resort population, that is, the number of persons transported to and from resorts of Michigan, numbered 1,000,000 and the their expenditures in the resorts ran close to $5,000,000. Advertising played an important part and everywhere "Michigan, the Playground of the Nation" was seen. Complaints about resorts and about nuisances at resort places were being received in steadily increasing numbers, and the department realized that some special attention must be given the subject. Travel by train with no equipment to do any testing "on the spot" was expensive and did not give the resorts the attention to which they were entitled. Literature on sanitation subjects and educational work were seen as essentials, and water testing, food and dairy inspecting at the site were necessary.

The designing and equipping of a traveling laboratory was the result. A speedwagon chassis, with bus-type body made higher to allow ample head room and specially fitted with padded drawers and compartments, was equipped with all the apparatus necessary to make the standard tests on water and milk and some diagnostic work such as could be done by means of direct smears or with solid media. Quite naturally a great deal of coöperation between the State Department of Health and the local medical profession had to be maintained. Although diagnostic work is not resort sanitation, the ability to accept and do such work in the field was appreciated in numerous localities. We feel that the added good will which this work created well repaid the time spent in such work. Having a bacteriologist with some knowledge of medicine proved to be a further help.

The first year this laboratory was in the resort districts, much had to be learned by the staff, which consisted of a sanitary engineer in charge, a bacteriologist, and a general assistant. It was known that education must play a conspicuous part and no opportunity to talk to groups, luncheon clubs and organizations was lost.

The resorters are largely from cities where strict milk ordinances are enforced and water carefully guarded. Change in location seemed to cause no thought that the same safe conditions might not exist at the resort. Surprise usually greeted the assertion that the milk and water supplies were potentially unsafe.

The work of the first year brought several points clearly to the attention of the department.

The staff was incomplete, as food inspection was necessary along with milk and water. The crowded conditions and demands for large quantities of food stuffs, with the great distance from the

Sewage disposal in a resort town

large markets, bring about the introduction of a great deal of meats and vegetables which are improperly handled. "String butchers" are numerous and their methods of slaughtering and handling their products are far from those approved by anyone versed in the requirements of such a business. Milk is often improperly handled and a dairy inspector becomes a necessary addition to the resort sanitation staff.

The unit staff should consist, therefore, of a sanitary engineer in charge, a bacteriologist, a food and standards man, and a general assistant to help with inspections and about the truck.

Every form of resort and tourist camp has its peculiar sanitary problems. I have divided the subject into four groups, based partly on the financial aspect of the problem and partly on the nature of the enterprise. The four groups are:

1. Hotels, in which are included the summer hotel and the rooming house or place that takes roomers, boarders or both.

2. Private cottages.

3. The lake resort aside from the hotel, where dancing, bathing and fishing are made the primary attractions and concessions are sold.

4. Camps, which include the charity, private pay, Boy Scout, Y.M.C.A., Y.W.C.A., and tourists' camps.

GROUP NO. 1. HOTELS

The hotel group represents the large initial investment type of resort where fixed charges—the interest on the investment and depreciation on the property—play an important part. High rates are charged and the front porch, lobby and dining room are made as attractive as possible. In sanitary features the place often falls short. The water supply is frequently from a well, poorly situated; toilet plumbing is antiquated and inadequate, while sewage disposal is neglected. Garbage is improperly handled. The kitchens and food storage facilities are dirty. An indication of just how extensively these conditions prevail is given in the statistics of one year's inspections.

CONDITIONS IN 72 HOTELS INSPECTED

Water supplies tested	50
Safe water supplies	58%
Safe sewage disposal	46%
Adequate garbage disposal	42%
Excellent sanitary condition	8½%
Good sanitary condition	40%
Fair sanitary condition	29%
Poor sanitary condition	22½%

Fortunately, this group has management and individuals who can usually be reasoned with or ordered to make improvements. In most cases cooperation in improving conditions is easily obtained.

The outstanding sanitation problem of this group is waste disposal. Con-

veniences are provided and an abundant although often suspicious supply of water is furnished; but they fall down on waste disposal. Often sewage is discharged directly into the lake or into a locally built or widely advertised, but questionable, type of septic tank and then into the lake. Seldom is tank effluent given secondary treatment, and where this is done the secondary treatment is usually very inadequate.

Garbage is usually collected by farmers, but sometimes is fed to a few pigs or chickens near the resort property or dumped wherever possible, but frequently is not properly disposed of.

Probably 50 per cent of the hotels provide places for cleaning fish caught by the guests, yet seldom do they provide any means for caring for fish offal or disposing of it.

GROUP NO. 2. PRIVATE COTTAGES

The private cottage owners group presents a condition which we have so far been unable to handle to our satisfaction. We have here a group, friendly with one another for social purposes only. The individual's own back yard is the limit of his worries; yet he is ready to complain at the first smell or annoyance his neighbor creates. The cottage is a luxury used but a month or two in a year and, as such, usually receives the minimum of expenditures. If ordered to improve sanitary conditions, the owner invariably wants to know why Smith or Brown doesn't have to do the same thing. Community pride is too often lacking, and when considered as a resort there is no one to enforce orders or cause even the abatement of minor nuisances.

Generally, these resorts are not located within corporate limits and the township health officer is expected to see that nuisance and unhealthful conditions do not exist. This person is usually a tradesman or farmer busy with his own affairs and unversed in sanitary procedure, who can hardly be expected to devote time enough to this work to insure efficient results. Very frequently his policy of action is dictated by the business men serving the resort. In other words, the resorter's open pocketbook is more to be considered than health.

When the resort is within corporate limits the local health officer is often too busy with his private practice to pay much attention to the resort, or, for the same pecuniary reasons that the township health officer has, he fails to act.

The state representative, therefore, has the work to do that requires time and effort, for he must work with each individual owner. To overcome this it was decided that resort associations would help materially. If the resort could be organized so that a few would speak for all, and what the few decided was necessary for the resort and ordered by them would be performed by all, our work would be greatly simplified.

Experience has shown that this is not always the satisfactory solution. At one resort, most of the cottage owners formed such an association and since then every nuisance has been simply the expression of petty meanness—kicking against the few who for one reason or another did not join—rather than trying to improve conditions. In the main, however, resort associations have assisted materially in relieving the constituted authorities of much detail work.

The sanitation problems of this group are, therefore, all the problems of sanitation. Water is usually obtained from shallow driven or dug wells which are invariably placed close to the kitchen door. Garbage is usually buried within a few feet of the well, and the privy is on the back end of the lot. As a rule lake resort lots are small, and locating the cottage, well, garbage pit and privy within the lines of the owner's lot causes a close setting which establishes a potential danger at the very beginning.

The inspector at such a resort can do nothing more than visit every cottage, take a sample of their well water, and inspect the premises. If any corrections

are necessary the individual must receive the order, and follow-up work must be done by the same department to see that orders are carried out. This is slow work and few resorts can be handled during the resort season without an unreasonable number of inspectors. The solution seems to be the provision by the state for full-time district or county health officers, and in the larger resorts, sanitary inspectors for the individual cases.

Another phase of this work which is encountered during the last two weeks of August is the desire of the cottager to evade the order to improve by shortening his stay a week or two, hoping, no doubt, that by the next season the nuisance will have disappeared. Frequently when an inspector has visited the resort and ordered the correction of insanitary conditions or the elimination of a nuisance, a return visit will reveal the fact that a day or two after the inspector's visit the tenant has packed up and gone home. Education along health requirements, and the common need of decency to the neighbor, seem to be the biggest need in this group when centralized government, as an association, is lacking. Careful inspection and follow-up work are essential.

GROUP NO. 3. LAKE RESORTS

The lake group offers the problems of safe water and food, sewage disposal and the care of fish offal. The group appeals not only to those who are seeking health for themselves or natural and artificial pleasures, but also to the robust lover of out of doors. Unpretentious cottages for renting are erected, and no attempt at providing the comforts of a home is made. And on the same unpretentious plan, privies are substituted for flush toilets, chemical closets or sewerage systems, with the result that water supplies are in greater danger of contamination. The beaches are free from contamination largely on the same account because there are no tank effluents to discharge into the lake.

Fish offal is the other nuisance offender. The desire to finish the necessarily dirty job of cleaning quickly and to get the catch in the pan, causes the careless handling of the offal. Seldom is it buried as it should be, and many are the fish cleaning tables found with the offal of numerous days' cleaning upon them, while the ground around is literally strewn with the same rotting material. The fostering of community pride and specific regulations requiring burial seem to be the solution.

The concessions seldom offer difficulties since they usually are boats for hire, bath house and refreshment concessions. Of course, the more extensive refreshment stands need some food inspection.

GROUP NO. 4. CAMPS

The camps are comparatively new and it is hoped that our friends of the east, west and south will give us some timely pointers on how they handle them.

Generally all camps are handicapped by a lack of funds. The degree and method of obtaining needed funds furnishes the basis for the classification.

Charity camps, as the name implies, try hard to do the most with the least expenditure. Any changes are secured by appealing to the contributors who through philanthropic motives desire to see them continue. For this reason it is often difficult to secure the necessary money.

The private pay camp furnishes the other extreme. Funds are not lacking, but the desire to make big money fast prevents expenditures for the proper necessities of a good camp. Crude types of latrines and poor types of housing facilities are often found, while the rates are attractive to the rich only.

Boy Scout camps are usually supported by the luncheon clubs, and hearty co-operation is obtained on essential features. When the person in charge clearly understands sanitary necessities, conditions are generally good.

The Y.M.C.A. and Y.W.C.A. camps are usually operated so as to be self-sustaining, and this feature is detrimental to successful coöperation in sanitation work

Any required changes are often figured in dollars and cents and what the result will be in the ledger.

Tourist camps in Michigan are practically all free camps. There are one or two pay camps, but the idea of making the tourist pay, thereby securing better sites and giving better accommodations, has not as yet taken hold in Michigan.

The camps maintained by the individual in connection with a gas station or lunch stand have received but little attention. The tourist knows they are maintained as a part of a money making scheme and their reason for existence is, therefore, the cause for avoiding them. It may be that if most of the free tourist camps become pay camps, those maintained by individuals will become important factors in the work, but as long as the free camp is the type in general use, they do not warrant the time nor money the inspection work would require.

Camp Nissokone (Detroit Y.M.C.A.), Van Ettan Lake
One of the most striking camps visited. Complete equipment for camping, including water supply, excellent latrines, sewers, and sewage disposal.

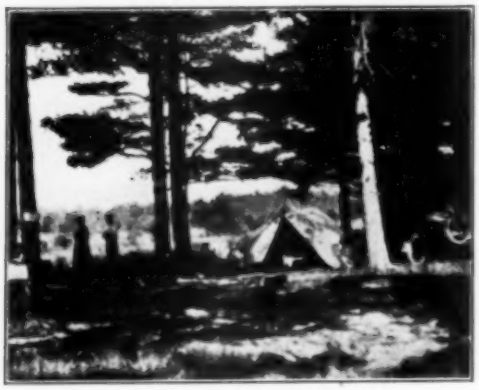
These camps are usually maintained by appeal to business men or by appropriations from the municipal treasury. Those maintained by public subscription usually furnish the poorest conditions. In these the business man is, as in the private resort, looking for the return his contribution will bring in business. The site is selected more with a view to its proximity to the business district than to its adaptability as a camp site. A few places to heat coffee and fry eggs, a water supply, a privy, and plenty of road advertising constitute his idea of a tourist camp site.

The camp maintained by the municipality out of an appropriation is usually better, as the motive for its existence is somewhat different, and the local health officer has some say in its establishment and maintenance. Greater pride is felt in such a camp because any complaints are reflections on the town rather than upon those supporting it. An attendant or grounds superintendent is usually provided at these camps.

Michigan is fortunate in having many state parks which offer free accommodations to the tourist. These parks, fifty-one in number, twenty-six of which are being developed as tourists' camp places, are primarily a part of the conservation scheme, and as such are under careful state control. A full-time caretaker is on the ground. Good water, usually from deep drilled wells, flush toilets with septic tanks and subsurface irrigation or chemical toilets, are provided, except in a few undeveloped parks where privies under careful supervision still exist. Garbage cans with fly-tight covers and disposal by incineration or burying; good, clean bath houses, and a community house are provided. A careful check of conditions at these parks is maintained by the Conser-

vation Department and we have never had any complaint about them.

With the exception, therefore, of the state parks and the private pay camps, the principal problem is doing the most for the least expenditure. The sanitary features of the camps are probably the best that can be afforded and any changes are hard to secure. The biggest thing to be gained is care and attention to what they already have, to see that unhealthful and unsanitary conditions do not arise, rather than to require new construction or reconstruction.



A typical State Park tourist camp

In looking back over the past years of resort work there appear two general problems in the sanitation work in resorts and tourists' camps. They are:

1. How can we get the cottage owners and hotel managements to maintain, and the renter or transient tourist to demand, the same careful attention to sanitation that they expect and get at their homes?

2. What can we do to get the proper working authority at the resorts, so that a few persons invested with authority, will be responsible for the sanitary conditions at the resort? Before any resort can hope to be a real healthy sanitary place, measures for securing the proper kind of sewage disposal, an efficient and uniform method of garbage collection and disposal, and a good, clean and properly handled milk supply are necessary. With only the state's representatives trying to secure these conditions, and with no local authority to constantly watch and require them, the difficulties presented are exceedingly discouraging.

After these two problems are solved the task will become much easier and the problem will be one of location—to know what type or kind of measure to apply in the particular locality. In some places tanks with subsurface irrigation cannot be used, because the ground water level is within six to twelve inches of the surface. Under certain conditions the chemical toilet is not feasible. Experience in the state parks has shown that chemical toilets are not suitable in such places. This type of installation is sold on a capacity rating and as long as they are not used in excess of that rating they will operate satisfactorily. It is impossible to determine the capacity demand in a tourist camp, and a guess at the requirements is invariably too low. The only way that the chemical toilet appears to be suitable for such purposes would be to secure one large enough for the absolute maximum demand rather than the daily average. The contents of the tank, to be thoroughly acted upon by the chemical must remain at least two months. Overloading causes too frequent drawing from the tank with the result that the effluent is not satisfactory. Another objection to the use of chemical toilets is the large amount of insolubles such as rags, bottles, boxes, etc., which they receive. Much annoyance and trouble from stoppages and trying to remove them from the tank are encountered.

It would seem that some sort of simple, inexpensive, yet efficient and fool proof, type of sewage disposal is yet to be devised for summer resort use.

This paper would hardly be complete were credit not given to the tourist and resort associations who have given hearty coöperation in our resort work. The Michigan Tourist and Resort Association, The Northeastern Michigan Development Bureau and the Upper Peninsula Resort Association offered exceptional assistance to insure support and coöperation from its members in our work.

SOME STATISTICAL ASPECTS OF PNEUMONIA

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Read before the Vital Statistics Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

ALTHOUGH many statistical studies of different sorts have been made and are being made on pneumonia, so that nothing remarkably new is likely to be discovered by any one group of investigators, the wide prevalence of this disease and its large fatality make it seem worth while that such studies should continue and should be reported in meetings like this. In reply, therefore, to a request from your Program Committee for a paper I decided to present some of the considerations which have been guiding us at the Harvard School of Public Health in our statistical work on pneumonia, and some of the results we have found.

PROPORTIONAL MORTALITY

In the first place I will present a table calculated for the ten original registration states of 1900 from the figures in the U. S. Mortality Rates 1910–1920, showing the percentage of the total mortality which is due to pneumonia (all forms) in various age periods and for several years or groups of years:

It is clear that the age group 1–4 of early childhood is that in which pneumonia forms the greatest percentage of all deaths (something slightly over 20 per cent); pneumonia is not nearly so fatal relatively speaking for infants, only about 12 per cent of whose deaths are due to this group of diseases, but the percentage would be considerably higher if the deaths of new born infants (under 2 days) were excluded in making the calculations. The percentages fall off to about 9½ in the group 5–9 years, and to about 7 per cent in the group 10–14 years. They are uniformly lowest in the age group 20–24, at about 6½ per cent, and rise to a maximum of nearly 9 per cent in the years 35–60, falling back slightly to about 8 per cent in old age. It is not the weakest nor yet the strongest who are most taken by pneumonia (as compared with all diseases); infants are not so much afflicted as young children, but older children and adolescents are less affected; the old and those in their twenties have lower relative mortalities from pneumonia than those in middle life.

IRREGULARITIES IN DISTRIBUTION

The general observations are not uniformly supported by the table. Note this curious anamoly: The year 1920 shows a very different distribution from the years 1900, 1910, 1920 or from the averages for the five year periods 1901–05 and

PERCENTAGE OF MORTALITY DUE TO PNEUMONIA—10 ORIGINAL REGISTRATION STATES OF 1900

Age	1900	1901–05	1910	1911–15	1920	1921	
Under 1	9.9	11.0	12.0	13.4	13.5	11.3	
1–4	18.9	19.5	21.8	24.1	23.5	19.5	
5–9	10.1	9.3	9.3	9.5	10.6	8.0	
10–14	7.6	6.8	7.2	7.1	8.6		Age
15–19	7.9	7.2	7.3	6.7	11.8	6.3	10–19
20–24	7.4	6.5	6.3	6.1	13.5	6.0	20–29
25–34	8.6	7.9	7.5	7.3	17.0	7.3	30–39
35–44	10.0	9.2	8.9	8.6	12.9	6.9	40–49
45–54	10.3	9.2	9.0	8.5	9.5	6.0	50–59
55–64	10.2	8.9	8.8	8.2	8.0	5.9	60–69
65–74	9.4	8.5	8.8	8.1	7.7	6.0	70–79
75 up	7.9	7.9	8.5	8.1	7.2	6.5	80 up

1911–15. Considering how regular the distribution is in all the other periods it is clear at once that conditions quite special must have been operating in 1920; a different kind of pneumonia—the figures for ages under 10 and over 55 are within the normal range but in the ages 20–34 they are over twice the normal. We are all aware that 1920 saw a recrudescence of influenza, that the proportional mortality due to influenza is distributed differently from that due to pneumonia, and that it is not always simple to distinguish influenza from pneumonia in a clear-cut way. The question of primary and secondary causes of death is involved here.

For scientific work in vital statistics it is unfortunate that such variations occur as are seen here between the figures for 1920 and for the other years. The object of the science of statistics is to discover and separate from each other the essential regularities and the nonessential irregularities in the variations of natural phenomena. When great and apparently anomalous variations occur they upset the calculations upon which rests the separation of essential and nonessential, and the investigator must have recourse to a very extensive series of statistical data or to the dangerous practice of somewhat personal and arbitrary adjustment of data. In this country our official vital statistics reported by the Census Bureau do not go back many years—we speak of the 10 original registration states of 1900. This gives us only 25 years including the present year, the results for which will not be available for some time yet.

CHANGING AREAS AND CLASSIFICATIONS

In the case of pneumonia one cannot use the figures of the Registration Area, because that area is always changing and the states which have been recently added are not homologous with the earlier ones in respect to pneumonia. For the Registration Area of the United States the mortality from pneumonia (all forms) shows a distinct progressive falling off during the twenty-one years 1900–1920; but for the 10 original registration states it is practically stationary. We are apparently not lowering our death rate from this cause or group of causes, but are extending our registration area to states which are more favorably situated and have lower rates. The changing Registration Area is a difficulty in the analysis of other diseases as well, and it is fortunate that the Census Bureau, realizing this fact, sometimes gives figures for the 10 original states in addition to those for the total area. I could wish that they always did so; it would add but one line to their regional tables.

In addition to the difficulty of changing regional classification, there is apparently a serious obstacle to statistical analysis in the changing classification of causes of death. I do not so much refer to changes in the official International List as the changes in the habits of reporting. This may be illustrated by the figures for bronchitis and bronchopneumonia. In 1900 chronic and acute bronchitis had a death rate of around 45 per 100,000; there was a somewhat precipitate decline to about 20 in 1911, and since then a slow drop to 16. For bronchopneumonia the course is inverse; starting around 25 in 1900 the death rate rose sharply to 50 in 1910 and has since risen very gradually to around 60. If one combines the increasing bronchopneumonia and the decreasing bronchitis he finds a nearly uniform set of figures. I do not mean to say that actually the reason for the diminishing of bronchitis as a cause of death is because much of what was formerly called bronchitis is now called bronchopneumonia; but I will venture the conclusion that in many cases, if not in these, progressive changes in death rates are due in no small part rather to progressive changes in modes or styles of diagnosis and reported classification of deaths and only in part to real changes in the status of man's combat with his diseases.

It may be an interesting study in psy-

chology or in medical history or in governmental regulations to pursue the varying course of mortality curves when the variation is due to subjective causes instead of to realignments and reinforcements in our line of battle. I take it, that these interests are not those of the practicing public health officer or practical student of medical advance; what they want to know is whether diseases and deaths of one sort or another are being to some extent effectively controlled, whether by preventive measures or curative methods. For some clear-cut causes of death where diagnosis is certain and where the complications of primary and secondary causes of death are lacking, sound conclusions may be obtained by relatively simple analysis of the figures reported, having regard to age, sex and race distribution in the population and geographical, social and economic distribution of the population. But for such diseases as the pneumonias it seems indispensable to consider also a variety of other related diseases which may modify the figures for the pneumonias and of which the figures may be modified by the pneumonias whether for one reason or another.

THE EPIDEMIOLOGICAL CYCLE

One serious difficulty in the statistical study of pneumonias and other winter diseases lies in the fact that statistics are reported for the calendar year, which cuts the epidemiological cycle of the disease in two. As a consequence, the death rate for pneumonia in a given year is made up of the last part of one outbreak and the first part of another, two parts which do not make a whole. In a series of eleven outbreaks which I analyzed, lying in ten years and parts of two others, I found that only in four of the ten years was there a single peak of pneumonia; in the six others there were either the peaks of two outbreaks or no peak at all. There is a well defined minimum in July or August, which if I may generalize from my short series, is low and relatively constant both in time and in amount, but the maximum is decidedly variable both in respect to the month of its occurrence and in its severity. The calendar year is not satisfactory; we should recompile the statistics on the basis of a year running from August 1 to July 30.

TRENDS FOR THE ORIGINAL REGISTRATION STATES

Perhaps from these few of many statistical aspects of pneumonia which I have cited, you will see why we believe we have reason to go slowly in getting into print the studies which we have been making during the past three years. I made a brief report to the National Academy of Sciences at its meeting on April 30, 1924.[1] I should be glad to furnish reprints of that article, so long as the supply lasts, to those who may be sufficiently interested to ask for them. The chief facts are that in the 10 original registration states mortality from: (1) Pneumonia (all forms) with a mean death rate of 152 per 100,000 has been running practically constant in the period 1900–1920; (2) Lobar and undefined pneumonia with a mean death rate of 105 has been decreasing about 2 units (2 per cent) per annum, or from 136 to 85; (3) Bronchopneumonia with a mean rate of 47 has been increasing 1.7 units (4 per cent) per annum, or from 30 to 64; (4) Bronchitis with a mean rate of 27 has been decreasing 1.3 units (5 per cent) or from 40 to 13; and (5) Respiratory diseases with a mean rate of 196 have been decreasing about 2.5 units (1 per cent) per annum or from around 222 to 170. The series of years is short and the figures are much upset by the influenza in 1918. It will be particularly interesting to see what happens during the decade after that epidemic. I hope that I shall have the opportunity to discuss the matter further before this Association when our studies have progressed further.

As we are here in Michigan I may

1. Is Pneumonia Increasing? *Proceedings of the National Academy of Sciences* (Washington), Vol. 10, No. 5 (May), 1924, pp. 161-166.

give you Dr. Tomanek's results* for this state:

MICHIGAN 1900-1920

Disease	Mean Rate	±S. D.	Trend
All Respiratory	146	±4	−0.5±0.6
Pneumonia, A. F...	102	±4	+0.9±0.6
Pneumonia, L. & U.	73.6	±2.7	−0.6±0.4
Bronchopneumonia..	28.5	±1.5	+1.5±0.2
Bronchitis	25.9	±1.1	−0.8±0.1

Compared with the 10 states, bronchitis is about average, but has been decreasing much more slowly; bronchopneumonia is low (28.5 as against 47) and has been increasing a trifle less rapidly. Lobar and undefined pneumonia is low (73.6 as against 105.5) and has been practically stationary; the net decrease is not significant statistically and the curve shows a decidedly parabolic curvature, decreasing from 1900 to 1909 and increasing since then to 1920. Pneumonia all forms is low (102 as against 152.5) and tends to increase rather sharply in the latter part of the period as in the preceding case. Finally the respiratory mortality is low (146 as against 196), but shows no significant downward trend as it does in the 10 states as a whole. In these figures an adjustment has been made for the influenza of 1918 but not for that of 1920.

* The statistical work on pneumonia was begun by Dr. Ewald Tomanek, Fellow of the International Health Board, under Dr. Rosenau and continued in association with me. His sudden call to the Health Section of the League of Nations has prevented us from getting his figures into print as early as might otherwise have been the case.

PUBLIC HEALTH PRACTICE IN SMALL CITIES AND TOWNS OF CONNECTICUT

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AND

FRANCIS M. MUNSON, M.D.

Read before the Public Health Administration Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 21, 1924.

THROUGH the coöperation of official and voluntary health agencies in twenty-one Connecticut towns of 10,000 to 30,000 population, a study has been made of health practice during 1922. A preliminary statement concerning this study was made last year in connection with a health program suggested for a community of 20,000 population.[1] The present report deals with the outstanding facts revealed by personal visits to these different communities.

Local health units are closely associated with the state and county organizations which actively coöperate with them. The State Department of Health was established by act of the Legislature in 1917, superseding, with increased powers, the State Board of Health, and acceding to the authority and duties of the latter body. The Public Health Council has established a state sanitary code which it has power to amend. Local regulations, to be valid, must be approved by the State Department of Health. The powers and duties of the Commissioner of Health are in accord with modern practice. In Connecticut, county health officers are lawyers. Except in towns whose limits are coterminous with those of cities or boroughs, these county health officers appoint the town health officers and assist them in legal questions.

The town health officer is required by statute to be ". . . some person learned in medical and sanitary science." He is appointed for a term of four years and may be removed by the county health officer. The city health officer and the borough health officer are appointed by the mayor of the city* or by the warden

* In the city of our study which employs a city manager, the health officer is appointed directly by him.

of the borough, and the appointment must be confirmed by the common council of the city or by the burgesses of the borough. If a vacancy exists for thirty days in the office of a city or borough health officer, it becomes the duty of the county health officer to fill this vacancy by appointment.

City and borough health officers are usually appointed for terms of four years. All town, city and borough health officers are required to file annually, on September 1, reports of their activities for the year preceding with the State Department of Health and with the county health officer. In addition to the daily reporting of cases, they are required, on or before the eighth day of each month, to make a report to the State Department of Health of all communicable diseases reported by them during the preceding month.

Health organization varies widely, and active boards of health are the exception rather than the rule. Official organization is of three main types. Six communities (five incorporated cities) have boards of health consisting of from three to seven members, appointed by the mayor, or by selectmen in case of the town, to serve for overlapping terms. Five of the boards include at least one physician each, and two include plumbers, while one includes a lawyer and another a milk inspector. Two of the boards have one or more women members and two include the health officer. Stated meetings are held once or twice a month. These boards, as a rule, seem to be active and anxious to support their executives. With the exception of the secretary of one of the boards, who receives $50 a year, and one instance of an administrative board, the members serve without pay. In addition, two health officers have appointed advisory boards, of four or five leading citizens including one or more women, who serve without remuneration.

A second type of organization is found in the town and the city, each having a manager to whom the health officer is directly responsible. In the case of the town, a new charter provides for a board of health, but at the time of our study this board had not been appointed.

The health officers in the remaining eleven towns and cities act independently except for advice received from members of the board of selectmen (five towns), of the board of aldermen or city council (three cities), or the board of wardens and burgesses (three boroughs).

Communities having a board of health or city manager, usually benefit from better organization and more adequate machinery for health activities than do those without the support of such interested members of society. Furthermore, a careful study of these different communities suggests that successful health practice depends to a large degree upon the interest, experience and available time of the health officer and his associates, plus favorable public opinion and a spirit of coöperation between the health department and other community agencies. Local physicians, visiting nurse organizations, and boards of education are all very important factors in the health programs of communities of this class.

The health officers are generally well informed concerning community affairs. Most of them are on a salary basis, although at least six are compensated by fees. All but one of the health officers of this study were on a part-time basis in 1922. A second health officer of this group has since become a full-time executive, and four of the others give most of their time to preventive work in their combined capacities as health officer and school physician.

The periods of service of the different executives ranged from one and one-half to thirty-six years in their present positions, with a median of fifteen years. Only two officials had previous experience in health work prior to their present positions, one having served for two, and one for eight years respectively. The yearly salaries or fees ranged from $300 to $3500, with a median of $900.

Few health officers have adequate quar-

ters for their official activities. Three have special offices in the city hall, and a fourth, who divides his time between his work as health officer and that of school physician, is comfortably housed in a school building. All the others use their own private offices for the health department, and in some cases provide in addition a considerable portion of the time of a private secretary. There is a lack of full-time employees, trained in modern health practice. Only six health officers have clerks, inspectors, or other assistants directly responsible to them.

Comparatively little publicity and public health education work is carried on locally except through the schools and in the homes by public health nurses. The new Bureau of Public Health Instruction in the State Department of Health has already proved of immense value to local health officers.

Another activity of considerable importance is the registration of vital statistics. In these towns, as in all but two of the larger Connecticut cities, this work is handled by the town clerk, who reports in turn to the State Commissioner of Health. It is doubtful if records are utilized locally as extensively as would be possible if they were handled directly by the health department.

The total per capita expenditure for health work by official and voluntary agencies in 1922 averaged 61 cents.* Of this amount, 20 cents was spent by the health department, 17 cents by other official agencies, chiefly by the boards of education, and 24 cents by voluntary agencies, chiefly for nursing. As indicated in the following table, 35 cents was spent for public health nursing, including school nursing work, and 26 cents for other public health activities.

The expenditures by all agencies range in amount in different places from 20 cents to $1.56, with a median of 49 cents. The expenditures by voluntary agencies range from zero to 68 cents with a median of 21 cents. It is interesting to observe that the expenditure figures show relatively slight relationship in either case to size of community. It is apparent that in most of these towns, official budgets should be materially increased to provide adequate health programs.

EXPENDITURES FOR HEALTH SERVICE, 21 CONNECTICUT TOWNS, 1922

Agencies	All activities Per capita	Nursing alone Per capita
Board of Health	$0.20	$0.02
Other official	.17	.09
Voluntary	.24	.24
Total	$0.61	$0.35

It is not possible to classify the data in detailed budgetary form under separate headings as administration, communicable disease control, and child hygiene. Specific appropriations for inspection other than that carried on by the health officer himself, were made in only nine towns. The average per capita expenditure for this inspection work amounted to between 4 and 5 cents by the board of health and to between 5 and 6 cents by all official agencies.

The state dairy and food commissioner is largely responsible for the inspection of dairies and milk plants from which milk is supplied to these towns, although twelve towns maintain some form of local inspection service. Most of the inspection by local agents is done by the health officer himself. With two or three exceptions, as in Greenwich and Middletown where milk is tested locally, laboratory samples which are collected from time to time from wagons and milk plants are sent to the state laboratory for analysis. Pasteurization is encouraged, but has not yet become so extensively practiced as in the larger cities, and usually includes less than half of the supply. Tuberculin testing of cattle is carried on by the state.

Only a few towns have local ordinances covering milk production and distribution and food supervision, although state regu-

* Exclusive of housing and plumbing inspection and garbage collection. Minor revisions have been made since our preliminary report as a result of added information. A large portion of the public health laboratory work and sanitary engineering activities is carried on by the State Department of Health, and no attempt has been made here to evaluate the cost of these services.

lations are excellent. Comparatively little food inspection work is done in most of these places. Special inspectors are employed for food supervision in only four towns, although the health officers of eight others do maintain some supervision.

Water is obtained from surface supplies. The entire supply of seventeen towns is chlorinated, while a portion of the supply of two others is thus treated. In one case slow sand filtration is also used. While there is practically no control over supplies by the health department, it is reported that the water sheds are systematically inspected by plant employees, and periodic samples are analyzed at the state or plant laboratories. In eleven towns, over 95 per cent of the population enjoys city water, in seven towns from 90 to 95 per cent, and in three towns less than 90 per cent. Ice supplies are inspected locally in a few instances.

General sanitary inspection for the prevention of nuisance is carried on in most of these towns by the health officer, aided in six cases by special inspectors. In two instances, these inspectors are employed by the selectmen rather than by the health officer. Inspections are usually made upon complaint. The card system of filing records of nuisances is employed in three instances, while a book is used in two other cases. Records of these inspections are not usually classified or preserved.

Building and plumbing inspection are now usually carried on by inspectors outside the health department, in a few cases under a department of public works. It is gratifying to note that much of this work which formerly occupied so large a part of the health officer's time[2] has been delegated to special inspectors.

Although less than a half dozen towns have local regulations covering the prevention of fly and mosquito breeding and the care and prompt disposal of stable manure, these subjects are covered by general statutes of the state. Five towns carry on anti-mosquito measures consisting of ditching and oiling, while another of about 23,000 population expends $5000 a year for this work. It is understood that not over two of the towns have special regulations regarding the construction of privy vaults or fly proofing of privies in areas not connected by sewers, but these subjects are also broadly covered by the sanitary code of the State Department of Health.

In only two instances does the health department assume charge of garbage collection and disposal, except from the standpoint of nuisance prevention. In two cities the work is handled by the department of public works, and in other communities where the work is carried on under official auspices, the board of selectmen or similar bodies are responsible. A state law places in the hands of a commission composed of the health officer and selectmen of the town the power to grant permits for garbage plants and their operation.

Garbage collections are usually made from one to three times a week. Wagons with covered metal bodies are used in only four cities. Licenses are issued to collectors by the health department in four cities.

In eight cases garbage is disposed of by feeding to pigs, in one instance at the city piggery. Dumping is employed in eight cities, a combination of pig feeding and dumping in three others; while in two towns garbage is burned. The per capita cost of collection and disposal in thirteen communities furnishing this information is reported to have been 39 cents. Street cleaning is not a function of the health department, but it is interesting to note in this connection that the twelve cities for which data are available spent 32 cents per capita for this work in 1922.

Nineteen towns have a more or less complete water carriage system for sewage disposal. In seven of these communities, the houses of 90 per cent or more of the population are connected with the sewers; in four cases from 75 to 90 per cent, and in three cases from 50 to 75 per cent. In the remaining communities, 50 per cent or

more of the population live in homes which have either cesspools, septic tanks, or pit privies.

In two cities sewage is treated by sand filtration; in five cases a portion of the sewage passes through septic tanks, and in one case through an Imhoff tank, before discharge into rivers. In the remaining cases where sewage disposal systems are provided, the sewage is discharged in the raw state into rivers.*

While a few of these communities have local regulations relative to the control of communicable diseases, the majority are governed entirely by the state sanitary code. The health officers are usually without local assistants in this work, but whenever necessary, receive active support from the Bureau of Preventable Diseases of the State Department of Health. Reporting of the important diseases compares favorably with that of the larger cities and is gradually improving as physicians come to realize their responsibility in this task. Placarding is practiced in diagnosed cases, while suspected cases are closely supervised, and modified quarantine is instituted whenever conditions warrant this action. Suspected communicable disease placards are supplied to local officials by the State Department of Health.

The problem of hospitalization of acute communicable diseases is a most important one in communities of this class. While in ten of these communities hospital facilities are available locally for medical, surgical and obstetrical cases, provision for handling communicable disease cases is offered in only six of them. The remaining communities depend upon accommodations in the isolation hospitals of the nearest large cities.

Vaccination against smallpox has been generally practiced in the majority of these towns, and a few of them, notably New London, have been active in diphtheria immunization work. Vaccines and sera are supplied by the state, and are distributed by local health officers.

Aside from nursing activities, there is relatively little anti-tuberculosis work carried on by local agencies. Tuberculosis cases are sent to county and state sanatoria. Four of the cities and towns have anti-spitting ordinances. Special clinics or conferences are held in a few communities to which private physicians volunteer their services. A special consultant of the state is also frequently in attendance.

Venereal disease reporting and practice are in accordance with the state sanitary code. In these smaller communities a large proportion of the cases are handled by private physicians. Cases not treated privately are sent to clinics in the larger cities (6), and to treatment stations (12) located in various parts of the state. In one city of this group a municipal venereal disease clinic is conducted toward which the state contributes the amount of the salary of the attending physician. The total cost for this clinic aside from rent is about $1000.

The health officers and physicians of all of these towns use the state laboratory for special examinations, and for diphtheria virulence tests, and most of them depend upon the state for all laboratory work. Greenwich, Manchester and Middletown have excellent local facilities. Information obtained from seventeen towns, including two with local laboratories, and from the state laboratory, indicates that an average of 32 specimens per 1000 population were examined in 1922. Twenty-seven of these, on the average, were diagnostic specimens, chiefly for diphtheria, syphilis (Wassermann), tuberculosis, gonorrhea, and typhoid, in the order mentioned. These figures indicate that less than half as many laboratory examinations in proportion to the population are made in towns of this size as compared with the large cities.[3]

The importance of providing health supervision for industrial workers is recognized more or less fully by individual plants in twelve of the towns. The

* Section 2555 of the revised General Statutes prohibits the discharge of any sewage into waters of the state after May 1, 1917, by any sewer system unless the plans have been submitted to and approved by the State Department of Health.

staff engaged in this work usually consists of one or more full-time nurses, and physicians who serve part-time or on call. The major part of this work consists in first aid treatment and home follow-up visits by nurses. Industrial hygiene work has proved of immense value and is fully as important in small communities as in large cities.

School health work is carried on, with two exceptions, by the board of education or by district school committees. In Enfield and New London the health officers are directly in charge of this activity.* A few towns have excellent programs, comparable with those of the larger cities.

The personnel usually consists of part-time physicians and full-time nurses although three towns were without school physicians and two had no school nurses at the time of our survey. The number of school physicians varied, three towns having as many as four, while two others had five. As previously stated, the health officer acted as school physician in several cases, in one instance, Fairfield, giving his entire time to the activities of school physician and health officer. In communities of this class which are unable to employ a full-time health officer, the combination of the positions of health officer and school physician to form a full-time health service has proved a practical procedure of merit.

In sixteen towns where complete data were available, there was a total enrollment of 247 pupils per 1000 population. The average cost per capita was 19 cents, or 79 cents per pupil. In towns having school nurses, there was an average of 9 schools, or 3200 pupils per nurse. The number of pupils in different places varied towns having school physicians there was an average of 2400 pupils per physician.

School physicians are required by law to make prompt examination of all children referred to them by superintendents, from about 2600 to 7000 per nurse. In principals and teachers, and to make such examination of teachers, janitors and school buildings as in their opinion the protection of the health of pupils may require. Pupils absent a stated period (usually 3 days) on account of illness or from unknown cause are required to have a permit to return to school, or to see the physician or nurse for examination. Special provisions for control of communicable disease are made in schools in remote districts. In such cases the teachers usually assume the responsibility for frequent inspection and reporting of suspicious cases to health authorities. In parochial schools the work is usually handled by the board of health or by volunteers.

In practically all of the towns an attempt is made to examine physically each child upon entrance, and annually thereafter. The staffs are too small to make thorough examinations, however, in more than two or three of these places. Efforts are chiefly directed toward the discovery of obvious defects such as those of sight and hearing, and to the control of communicable disease. Continuous records are kept in fourteen of these towns. Nurses visit the homes to discuss the results of physical examinations with parents, and urge consultation with family physicians for the early correction of physical defects. The work of the school nurses in these towns is one of the best features of the entire health program.

Special classes for educationally exceptional children are conducted in seven towns, while nutrition work is carried on in special classes or in the form of lunches in all but three instances. Parent-teachers' associations and women's clubs assist in the latter work. The town of Manchester has two admirably equipped open air schools and particularly good gymnasium and playground facilities. Dental hygienists are employed by five towns, and one of them has a special dental clinic for school children.

Public health nursing, usually supplied by voluntary agencies, occupies a very im-

* Section 2364 of the revised law of 1918 as amended in 1919 by Chapter 209 gives the local health officer jurisdiction over schools and also the power to call in the State Department of Health on occasion.

portant place in the health program of each of the communities studied. In only two cities and one large town are nurses employed by boards of health. There were in all 98 nurses employed in these towns in 1922 for all kinds of nursing work, giving on the average 5.1 nurses per 20,000 population. Nineteen of the 98 nurses, however, were engaged in industrial nursing, and did comparatively little district nursing work. Their duties in many cases were primarily confined to dispensary and first aid care. If only the district and school nurses are considered, there was an average of 4.1 per 20,000 population.* The numbers in different places varied considerably from an average of 1.4 to 8 for every 20,000 people, with a median of 4.

It is noteworthy that in ten of these communities, nurses were on a generalized basis. Middletown, for example, had an excellent district nursing organization consisting of 8 nurses, including the supervisor. Here the nurse provided by one of the industrial plants as well as the school nurse also came under the supervision of the head of this organization.

The nursing programs of most of these organizations included prenatal and infant hygiene, tuberculosis work, and bedside nursing. Particular attention was given to tuberculosis work in five cases, where the work was usually sponsored by a Red Cross or tuberculosis organization. Tuberculosis clinics, with volunteer physicians and visiting nurses in attendance, were reported as held regularly in four communities. There is apparent need of increased nursing service for home follow-up of clinic cases to stimulate return visits and to make certain that instructions are properly carried out.

Obstetrical nursing was regularly carried on in nine of these towns, while in others, nurses sometimes assisted in emergency cases. This work was performed in two cities under a system of rotation, with extra pay for overtime. Prenatal care was regularly given by the nurses in home visits and prenatal conferences were held in four of the largest cities or boroughs.

Infant hygiene conferences, usually with volunteer physicians in attendance, were reported as a part of the nursing activities in fifteen of the twenty-one towns. These conferences were started in several of the towns by representatives of the State Department of Health, in other instances by local initiative. In a few places these conferences are held as often as once a week, in a room in the town hall, as in Ansonia, in school buildings, as in Torrington, or in a health center, as in New London. Rarely does the child health program place sufficient emphasis on pre-school problems.

A study of public health nursing work in the small cities and towns of Connecticut shows a gradual increase in the number of nurses in the field and in their activities. Official as well as voluntary agencies have recognized the need for this type of service. The active coöperation of the nursing bureau of the State Department of Health, and the interest shown by various women's organizations have been important factors in bringing about these results.

In conclusion, it is apparent that public health work in small cities deserves more attention than it has previously received. Its development requires the leadership of the highest type of public health administrators.

* In this connection it is interesting to note again the findings of the Committee on Municipal Health Department Practice of the A.P.H.A. relative to the adequacy of nursing service in the 83 large cities of the United States in 1920. Even in the large cities, public health nursing service was found to be still inadequate in amount, the average ratio of 3.3 nurses per 20,000 population (as compared with 4.1 above) being about one-third of an ideal figure.

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THE RESPONSIBILITIES OF BOARDS OF HEALTH AND BOARDS OF EDUCATION IN THE CONSERVATION OF VISION IN CHILDREN

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Read before the Child Hygiene Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

ONE OF THE items of the modern health conservation program is the prevention of blindness, an important part of which is the conservation of sight. Boards of education and boards of health are more responsible for conserving this vision than any other agencies, except perhaps the oculists themselves.

These boards share responsibility for the provision of properly lighted buildings, free eye clinics, proper remedial treatment, and instruction and training of pupils in proper health habits; but this paper proposes to deal mainly with the provision of adequate measures for detecting and correcting defects of vision in school children.

The National Committee for the Prevention of Blindness, in coöperation with various agencies, has been engaged during the last six months in a study of the eyesight of school children in an attempt to describe and evaluate actual practices followed in public schools, and to prepare a recommended procedure to be followed.

Since the study is still incomplete, this paper cannot give the final conclusions that might be based upon its findings. The author believes, however, that the responsibilities of boards of health and education as here set forth represent fairly well basic principles as already indicated by the research, and he invites criticism and suggestions to the end that the study may be made more useful in helping to conserve the eyesight of America's children.

Sight conservation should have a more important place in the health education activities of our public schools. Health education, in so far as it relates to the detection and correction of physical defects, is sometimes under the direction of boards of health and sometimes under the direction of physicians employed by boards of education. In either case, the type of service should be the same and it is the service rather than the agency with which we are here concerned.

THE DETECTION AND CORRECTION OF DEFECTIVE VISION

Defective vision is a "health defect." "A health defect" is defined by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, of which Dr. Thomas D. Wood is chairman, as "a condition actually or potentially detrimental to a child's health or efficiency; the type that should be recognized and corrected if remediable." This definition as applied to "defective vision" constitutes an educational handicap.

"Diagnosis" and "treatment" are terms which may be substituted for "detection" and "correction." There is general agreement that schools should discover defective vision. There is *not* general agreement that the schools are responsible for the correction of defective vision.

It is important to determine to what extent defects in vision and diseased eye conditions can be discovered by examinations which it is practical to conduct in schools. It is obvious that this would depend to a large degree upon the knowl-

edge and skill possessed by the individual examiner, and the time which is given to the individual examination. Such examinations are now given by eye specialists, by general practitioners, by nurses or by teachers. It would, of course, be ideal to have all school children's eyes examined by ophthalmologists in adequately equipped rooms. That is, to have every child given the same careful examination which the child now receives if he is fortunate enough to have well-to-do parents who realize the importance of careful periodical eye examinations. Due to the expense and time involved, no public school system has yet approximated this ideal and it is doubtful if many private schools have, so far, given such careful examinations.

EXAMINATIONS GIVEN BY PHYSICIANS, NURSES AND TEACHERS

In actual practice examinations are given by medical examiners, by nurses, by teachers or by a combination of these. According to reports from approximately three hundred cities of over 10,000 population received by the National Committee for the Prevention of Blindness, eye examinations are now being conducted by the following agencies:

TABLE OF 300 CITIES REPORTING

Percentage of cities	Examinations made by
20%	School physicians
25%	Nurses
20%	Physicians and nurses coöperating
15%	Classroom teachers
20%	Combinations of the above

These reports indicate that in about 80 per cent of the cities reporting the teacher does not have full responsibility for testing, but merely acts as assistant in tabulating results.

It is axiomatic to state that eye examinations should be made by the best trained specialists; the ideal can seldom be reached. The practical question is: "Do the examinations now being given or which may be inaugurated actually detect defective vision and diseased eye conditions?" This question is especially pertinent in cases where the examinations are given by teachers. Is it worth while to have teachers use the Snellen test to measure visual acuity? How accurate are the results? There is fairly common agreement that it is better to have teachers give vision tests than to have no tests given at all. There is disagreement from the opinion that the tests given by teachers are satisfactory. Much harm can be done by the broadcasting of such statements as one which recently appeared: "This is one class of physical examinations (eyes) where the teacher can render a valuable service equalling that of the school nurse or health officer."

LIMITATIONS OF PRESENT METHODS

There are some obvious limitations to eye examinations as usually made in public schools.

1. An examination to determine visual acuity is not a substitute for a thorough eye examination. A test for visual acuity may and often does fail to show diseased conditions of the eye, and to detect hyperopic and astigmatic conditions.

2. The amount of training and experience of the examiner is an important factor in determining the value of an eye examination.

3. No periodic eye examination should relieve the classroom teacher from reporting unusual eye conditions whenever found. It follows that every teacher should be trained to report to the health division of the schools any abnormal eye conditions which may be observed at any time.

4. There is no common measure of defective sight which is of uniform value in recording the results of eye examinations due to differences existing between individuals. That is, a small loss of vision may not be serious for one child, whereas for another the same loss may constitute a serious health defect.

EXTENT OF DEFECTIVE VISION AMONG SCHOOL CHILDREN

Exaggerated statements are being made continually of the amount of defective

vision among school children with the more or less concealed motive of alarming people into obtaining glasses. It is generally recognized that the perfect eye is very rare, but any impression that the nation is rapidly going blind, or that over half of our school children need to wear glasses is so obviously an exaggeration, that the true condition of affairs is lost sight of. There is a small percentage of children in our schools suffering from eye diseases or defective eyesight which constitute health defects. Many of these defects may be removed by properly fitted glasses or by medical attention.

Since boards assume responsibility and are often authorized by state laws to conserve sight, they should have knowledge of the approximate number of children who may be expected to present handicapping eye conditions. This knowledge is difficult to obtain. Statements are made, unsupported by reliable evidence, that the percentage is very high. Sometimes it is given as high as 60 per cent. Reports from school districts covering the examination of the eyes of 4,711,021 school children during the past school year indicate that 572,525, or 12.1 per cent, have defective vision. The results of school examinations cannot, however, be accepted as wholly reliable because of the varying conditions under which the eye tests are made.

There can be little question that the eyes of children reported as having normal vision may have some slight degree of ocular defect; but physical vigor and general health tone enable the child to have standard vision in spite of the eye imperfection. Until there is some more uniform procedure throughout the country in giving examinations, this percentage must be accepted as a fair indication of the size of the problem which defective vision presents to school authorities.

It would appear from the reports received that the percentage of defective vision in rural districts is generally higher than that of city districts. The figures from Pennsylvania are representative. In rural districts the percentage of children testing 20/30 or worse on the Snellen chart was 16.8 per cent. In cities of 10,000 to 30,000 the percentage was 12.3 per cent. In cities over 30,000 the percentage was 8.5 per cent.

The probable explanation of this difference is that the follow-up and corrective measures in the cities are superior to those in the rural districts, with the result that more children have their vision brought to normal by the use of glasses and are not thereafter reported as defective. The difference can also be accounted for in other ways, such as poor vision resulting from the inferior lighting of rural schools and rural homes as compared with urban schools and homes. The medical inspection and correction in larger cities is generally much better organized than in smaller cities and rural communities. Diagnostic and remedial measures are more frequent and more sure in the cities.

It is gratifying to note the rapid increase in the number of children who are given eye examinations. Approximately one-third of the 24,000,000 public school children in the United States have their eyes examined every year. Since in many districts each individual child does not have his eyes examined annually, but rather every second or third year, it is probably safe to assume that over half of the children of the public schools of the United States have their eyes examined one or more times during their school careers.

It is apparent then that about one-eighth of our school children have seriously defective vision, *i.e.*, vision so defective as to constitute a health defect or an educational handicap.

EYE EXAMINATIONS A PART OF GENERAL PHYSICAL EXAMINATIONS

During the last few years much advance has been made in physical education, and there is a growing tendency to have complete physical examinations made of

school children of all ages. Eyesight tests are and should be properly a part of such complete physical examinations, and the records of eye conditions should be included with all permanent physical examination records. Special eyesight conservation days are of slight value, other than to call the attention of the public to the need of proper care of children's eyes throughout the year.

The efficiency of a board's work in sight conservation depends to a considerable extent upon the situation with reference to general health education in the school system. Wherever there is a system of medical inspection with an adequate staff, the follow-up of visual examinations will result in a much higher percentage of the removal of health defects, than in a system where teachers make eye examinations and do no more than send a formal report to the home calling attention to the health condition. Effective sight conservation in the public schools is a corollary to an effective medical inspection service.

STANDARDS FOR MAKING EYE EXAMINATIONS

The methods of making examinations vary greatly, and there is no general agreement as to standards which should be applied. Fortunately, the Joint Committee on Health Problems in Education has undertaken as a part of its general program for health education a study to determine norms for eye and vision defects. This committee is securing, in coöperation with the National Committee for the Prevention of Blindness, a consensus of opinion on this subject from eminent ophthalmologists. While the statement is still in the process of revision, it has reached a stage where it is of assistance in determining the responsibilities of boards in setting up standards. The opinions of sixty leading ophthalmologists were first determined by a questionnaire study. These opinions were tabulated, and statements formulated embodying the consensus of the opinions expressed. These were in turn submitted to a small group of leaders in the profession, representing the private practitioners, the ophthalmologists of health departments and of public schools. Of the twelve replies received, the statements are endorsed *in toto*. It may therefore be accepted as a reliable standard for school examinations.

This report will cover vision defects from the standpoint of the kind of tests to be given, systems of recording to be used, the frequency with which tests should be given, the degree of defective vision which should receive special attention, and also will define and describe some of the more characteristic sight defects and diseases which it is practicable for a general practitioner or nurse to recognize. The statement will also be of use in assisting teachers who may be called upon to give eyesight examinations.

If boards of health and boards of education will accept the report of the "Joint Committee" when it is in final form, the following will result:

1. A uniformity of procedure will supplant the present differing methods of making eye examinations.
2. Eye examination will be conducted in accordance with standards recognized by ophthalmologists as being correct.
3. It will be possible to compare conditions in different schools, localities, and times.

CORRECTION OF DEFECTIVE VISION

So far, we have considered only the detection of eye defects. It is obvious that little if any good will result if sight saving activities end here.

There can be no agreement at present as to how far the responsibilities of boards should go in bringing about the correction of eye defects. Opinions range all the way from those who are opposed to any form of eye examinations in schools to those advocating state medicine.

The prevailing opinion, however, is that

boards themselves should not correct defects, but that their activities should be confined to reporting these to parents and guardians and securing remedial action by a follow-up system.

There can be no disagreement as to the school's responsibility for preventing defects by providing proper lighting and seating conditions and by adjusting the curriculum to meet the actual eye conditions of pupils with defective vision. We are concerned here with the responsibilities of the school in securing the removal of educational handicaps—making children educable.

It is apparent that the detection of seriously defective sight or diseased eyes should be followed at once by a definite report from the examining agency to the parent. This report should be accurate, and should be accompanied by a simple statement giving the possible consequences of defective vision to health and education. A simple notification to a parent of a health defect in his child will many times ensure remedial action on his part; nevertheless, there are always large numbers of cases where a second notice or even personal interviews may be necessary to convince a father or mother of the need of correction. School authorities sending notices to parents should provide for a report by the parent on action taken.

What is the board's responsibility with reference to the cases where a notice and follow-up work do not bring the required result? The board's responsibility is clear when it discovers that the child's parents though willing are not in a financial position to secure and pay for services of eye specialists. In this case boards should arrange for correction or treatment through any available agencies in the community, the cost being met by philanthropy or by public funds. In a considerable number of the cities of the country this need is met by eye clinics established for the purpose.

SIGHT CONSERVATION CLASSES

In a large number of cases of defective vision the handicap can be removed. There remains, however, a considerable number of children with such defective sight or diseased eyes that, even with the best glasses possible or the best treatment, they are still unable to reach anything near standard vision. It is true that the percentage of such children is very small, possibly one child in five hundred. Nevertheless, in the aggregate they provide a distinct class of children who cannot be educated by the usual methods. Here again education for children with seriously defective sight should follow the precedents which provide special classes for the deaf, for the tubercular, for the crippled, or the mentally deficient.

These classes for children handicapped by eye defects are usually known as conservation of vision classes. Approximately two hundred of them have been established in the various cities of our country. This is not a tithe of the number which should be organized to meet the very apparent educational need, and boards should feel the responsibility of providing a modified form of education for children with seriously defective sight.

There is an unfortunate tendency to call these classes "classes for the partially blind." This leads to a misapprehension as to the purpose of the classes, and often defeats the aim for which they are established, namely, conservation of vision.

There must be the closest coöperation between educational authorities and medical authorities to determine whether the educational requirements are within the powers of the sight of the children in these classes.

CONCERNING THE RELATION OF THE BACTERIAL COUNT TO THE PUTREFACTION OF MEAT

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Presented at the Annual Meeting of the Society of American Bacteriologists, New Haven, Conn., December 27-29, 1923.

IN 1914 Weinzirl and Newton [1, 2] published two papers, one giving bacterial counts for 44 samples of market hamburger steak; the other presenting the methods of analysis and proposing a standard of 10,000,000 bacteria per gram of meat for condemnation purposes. The purpose of that investigation was to furnish a bacteriological equivalent for Wiley's organoleptic test and for Eber's ammonia test. In the former paper occurs this statement: "There is no close agreement between the number of bacteria present and the degree of spoilage as judged by this test (organoleptic). Roughly, 25,000,000 bacteria are present (per gram of meat) in the winter when the nose condemns, and perhaps 200,000,000 in the summer marks the same point."

To discover the cause of the discrepancy noted above the bacterial flora occurring in putrid meat was first studied; then the organisms were isolated and added to meat to determine whether they caused spoilage. These studies have thrown considerable light upon the relation of the bacterial count and its significance as an indicator of spoilage.

HISTORICAL REVIEW

The literature has become quite voluminous and hence only some of the more important papers will be reviewed under the following heads:

a. *The bacterial count.* Apparently few investigators have published numerical counts of bacteria in meats. The earliest worker was Marxer,[3] 1903, who set up a standard of 1,000,000 bacteria per gram for condemnation purposes.

Carey,[11] in 1916, made bacterial counts of 34 samples of sausage. With incubation of the plates at 20°C. for 48 hours, 21 of the samples showed more than 1,000,000 bacteria per gram, and 3 more than 10,000,000. Because the counts varied widely and bore no direct relation to the sanitary conditions found in the markets, he was inclined to attribute little sanitary significance to the count. However, the presence of sodium sulphite and condiments in his samples doubtless influenced the results.

In 1917, LeFevre [4] analyzed 22 samples of hamburger purchased in the markets of Washington, D. C., during the months of November and December, repeating the work of Weinzirl and Newton and obtaining at the same time other valuable data. He confirmed their results in all essentials, but concluded on sanitary grounds that the standard for condemnation should be 1,000,000.

Hoffstadt,[12] in 1924, made a comparative study of the bacterial count, organoleptic test and sanitary conditions in the shops. Forty-nine samples were analyzed, some of which were held in the laboratory and the analysis repeated at two-day intervals. She found no correlation between the counts and the factors tested, and concluded that bacterial counts as a standard for meat analysis can be eliminated.

b. *The bacterial flora.* Apparently Tissier and Martelly,[5] 1902, were the first to make a comprehensive study of the flora in meats. They isolated 13 aerobes and anaerobes as follows: M.flavius liquefaciens (Fluegge), Diplococcus griseus non-liquefaciens, Streptococcus pyogenes, Staph.pyogenes blanc, B.coli, B.filiformis aerobius, Prot.vulgaris, Prot.zenckeri.

Diplococcus magnus anaerobius (N.S.), B.gracilis putidius (N.S.), B.putrificus (Bienstock), B.perfringens, and B.bifermentans sporogenes (N.S.). They believed that the fermenting aerobes prepared the way for the putrefying anaerobes.

Carey[11] found B.coli commonly present, Prot.vulgaris in 33 per cent of his samples, and organisms related to B.enteritidis in 25 per cent. He was interested in disease bacteria, but apparently not in spoilage.

Recently Hunter,[6] 1920, 1922, has made an extensive investigation of the flora of spoiling salmon. He was unable to identify all of his organisms, but most of the unidentified cultures simulated the ones identified and may be regarded as belonging to the same or similar groups. His isolations were as follows: Bact.formosum, Bact.cloacae, Bact.alcaligines, Bact.coli, Bact.communior, Bact.aerogenes, Bact.breve, and Ps.fluorescens. To his great surprise no spore-formers either aerobic or anaerobic were found. Cultures of yeasts, micrococci and streptococci were also found, but were rejected as not related to the putrefaction of salmon. The organisms identified were commonly found in sea water and in the canneries. Hunter concludes as the result of trial experiments that these organisms cause the "decomposition" of salmon.

Hoffstadt[12] isolated 645 cultures from 15 samples of meat; of these 182 were cocci, 317 non-spore-forming rods, 146 spore-forming rods and 6 yeast. No group was dominant, although the non-spore-formers were the most constantly present. She also isolated 347 anaerobic cultures which were grouped as proteolytic, medially proteolytic and saccharolytic. The presence of each group is indicated by a definite type of spoilage, but there was no relation between the anaerobe present, the original organoleptic test, the sanitary conditions or the aerobic count. She concluded that the presence of proteolytic anaerobes indicates a definite way by which the keeping qualities of meat can be predicted.

c. *The cause of putrefaction in meat.* A survey of the literature reveals many studies on putrefaction, but most of them bear only indirectly upon meat. The work of Bienstock[7] is so well known that it need not be reviewed in detail. He isolated B.putrificus and concluded that it is the cause of true putrefaction which he defined as the bacterial decomposition of albuminous material accompanied by the formation and elimination of foul smelling substances.

Tissier and Martelly[5] in their study, found that anaerobes caused putrefaction, but they believed that certain aerobes prepared the way for them.

Rettger[8] has published several papers on putrefaction, and has repeatedly shown that only anaerobes can initiate putrefaction. He does not consider digestion of the type produced by Prot.vulgaris and B.subtilis as putrefaction, since foul odors are not produced.

Hunter,[6] as already noted, found the colon-cloacae group which he regarded as causing "decomposition" of salmon.

Hoffstadt[12] states in her paper that each type of spoilage represents a special type of anaerobe.

EXPERIMENTAL RESULTS

In our work the bacteria present in 40 samples of putrefying meat were isolated and the species identified. This study revealed the presence of a considerable number of species belonging to the common saprophytes, as follows: (1) Sarcina lactea, (2) Proteus vulgaris, (3) Baccillus mesentericus, (4) Bacillus subtilis, (5) Bacillus vulgatus, (6) Escherichia coli, (7) Pseudomonas fluorescens, and (8) Micrococcus liquefaciens. Bacteria isolated from only single samples of meat were not identified because of doubtful significance. The prevailing organisms, both as to numbers present and times isolated were Sar.lactea and Prot.vulgaris. Both of these organisms have been isolated repeatedly by others.

but the importance of Sar.lactea has apparently not been fully appreciated. In some instances it comprised 90 per cent of the colonies appearing on the agar plates. This organism produces acid and hence tends to sour the meat, thus initiating the earliest deteriorating change. Prot.vulgaris also attacks glucose, but it is primarily a digester of proteins. Sar. lactea may dominate the field until carbohydrates are exhausted.

The organisms isolated together with some representative stock cultures of aerobes and facultative anaerobes were inoculated into sterile salmon contained in test tubes, and incubated at 20° and 37°C. respectively. A sterile solution of 0.1 per cent lead acetate was added to the tubes to indicate the production of sulphides. Incubation was continued for two months, but only traces of sulphides were formed. The cultures gave off no offensive odors and the salmon could not be called putrid in the sense used by Bienstock and by Rettger.

Since the organisms employed in this experiment included those commonly found in putrefying meat, the results were somewhat surprising. The experiment was repeated with sterile beef, but with like results. Thinking that the cooking might alter the meat sufficiently to prevent putrefaction, sterile raw rat meat was secured, placed in normal salt solution, and after incubation for five days at 37°C. to prove its sterility, it was inoculated with the cultures. Again they failed to produce putrefaction. If putrefaction be defined as the production of ill-smelling sulphides by bacteria, obviously aerobic and facultative bacteria do not cause it.

These experiments were repeated, employing the anaerobic cultures kept in stock as follows: (1) Clost.putrificum, (2) Clost.tetani, (3) Clost.sporogenes, and (4) Clost.welchii. These cultures produced decided blackening of the lead, and to the sense of smell putrefaction was overwhelmingly evident. There is then no doubt that the anaerobes cause putrefaction, as defined above, and this work, therefore, confirms that of Bienstock, Rettger and others.

The question then arose, are the anaerobes present in putrefying meat? Fifty samples of meat, secured from a large number of markets and comprising all varieties, were analyzed for anaerobes. They were taken to the laboratory in their original wrappers, aseptically transferred to sterile cotton stoppered bottles and allowed to putrefy at 37°C. When putrefaction was evident they were analyzed for anaerobes.

During the earlier trials the search for anaerobes was made by means of the writer's[9] anaerobic spore test, one gram of the putrid meat being placed in a tube containing 1 c.c. of paraffin and about 10 c.c. of dextrose bouillon. The tubes were then heated to 80°C. for 10 minutes to kill vegetative forms and to produce anaerobic conditions. The paraffin cover served to maintain anaerobiosis and as an indicator of gas production. Soon the inadequacy of this test was discovered, for Clost.putrificum does not produce gas. Thereafter the isolation of anaerobes, whether they showed gas or not, was undertaken from all tubes. At first the isolations were made by means of shake cultures in deep glucose agar tubes. Later they were made in glass tubes, 5 mm. internal diameter, according to the method of Heller.[10] All 50 samples showed the presence of anaerobes in one gram samples of meat. There is then no doubt about the presence of anaerobes in putrefying meat; and since the aerobes and facultative organisms do not cause putrefaction, we are led to conclude that the putrefaction is due to the anaerobes. This explains the discrepancy between the bacterial count of aerobic and facultative bacteria and the degree of putrefaction present in a given sample of meat.

RELATION OF RESULTS TO BACTERIAL COUNT

Since the bacterial count on aerobic plates embraces aerobic and facultative bacteria only, it is obvious that it cannot

directly indicate the putrefaction of meat. Has the bacterial count, therefore, lost its sanitary significance? If the spoilage of meat were simply a matter of putrefaction then the count could have little or no significance. But spoilage is a complex process. In the first place, it is a souring of the meat due to fermentation of the carbohydrates present by aerobic, facultative and anaerobic bacteria; secondly, it is a digestion of the proteins by aerobes and facultative anaerobes without abundant evolution of sulphides; thirdly, it is the production of indol, skatol, and other vile smelling compounds by aerobic, facultative and anaerobic bacteria; and fourthly, it is putrefaction with the production of sulphides by the anaerobes.

Obviously the bacterial count is at least a partial indicator of spoilage. It indicates the sanitary conditions, especially temperature, under which the meat is kept, and since these conditions determine whether or not putrefaction takes place, it may, therefore, be regarded indirectly as an indicator of putrefaction. The bacterial count indicates roughly for meat what the bacterial count of milk indicates for the sanitary conditions of milk.

It must be clearly understood that the aerobic bacterial count does not directly indicate putrefaction. If a test can be devised that will reveal the presence of putrefactive anaerobes, it would perhaps be of greater value. Such a test would be analogous to the B. coli test in water analysis. Until such a test is devised, the aerobic count cannot well be dispensed with, especially in cases involving court testimony.

SUMMARY

Forty samples of spoiled meats were analyzed aerobically for species of bacteria present and all cultures found more than once were identified. The predominating organisms were Sar. lactea and Prot. vulgaris. Fifty samples of putrid meats were analyzed for obligate anaerobes which were always found present in one gram samples.

The aerobes and facultative anaerobes found were inoculated into both cooked and fresh meat, but they never produced typical putrefaction as indicated by the liberation of sulphides. They may cause souring and digestion.

When anaerobes were inoculated into sterile meat they produced strong putrefaction.

CONCLUSIONS

Aerobic and facultative bacteria assist in the spoilage of meat, but the putrefactive odor is mainly due to anaerobes. The aerobic bacterial count is, therefore, only indirectly an indicator of putrefaction. It does, however, indicate certain types of spoilage, and the sanitary conditions under which the meat is kept. A test for anaerobes in meat, comparable to the B. coli test in water analysis, appears highly desirable.

ACKNOWLEDGMENTS

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THE CONTROL OF THE PUBLIC HEALTH LABORATORY

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THE CONTROL of public health and medical laboratories, with the standardization of laboratory technic and minimum requirements of laboratory workers, is receiving more and more attention. Such supervision may be self-imposed by an organization of the laboratory workers themselves; or it may be carried out by a state agency. The furthest developed system of supervision is that of New York State [1] where it is required that specimens from cases of communicable diseases be sent to a laboratory approved by the State Commissioner of Health.

The need for inspection and supervision, even of laboratories of good repute, has been emphasized by Slack [2] when he found that at times serious disagreements existed among laboratories examining portions of the same specimens. Wadsworth [3] reports a similar lack of agreement in certain procedures. Contrary to the usual opinion, the most serious discrepancies arose regarding tests other than the Wassermann; indicating the need for standard methods and frequent checking of technicians.

In the State of Illinois there has been no attempt by the State Department of Public Health to standardize or inspect laboratories. There is a statute regarding the Babcock test, administered by the Division of Foods and Dairies of the State Department of Agriculture, part of which reads as follows: "Sec. 20-a. Testing apparatus—License. No person shall operate a milk or cream testing apparatus to determine the percentage of butter fat in milk or cream for the purpose of purchasing the same either for himself or for another without first securing a license from the Dairy and Food Commissioner of this State, authorizing such person to so operate such tester." Very recently there has been organized in the state the Illinois Public Health Laboratory Association, the object of which is to improve the standard of laboratory work. Members of the State Department of Public Health are taking an active part in this as individuals, but the organization is entirely unofficial. In order to find out what the other forty-seven states are doing in the way of laboratory control, a questionnaire was sent to each laboratory director in the state department of health. The following questions were asked:

Are the private laboratories of your state supervised by any governmental agency?

If so, what department?

Are such laboratories controlled by a state ordinance or by rules of a state department or board?

Are such laboratories given a license or just a certificate of recognition as reliable laboratories?

Please state your opinion as to conditions in your state regarding (a) the necessity, (b) the practicability, and (c) the advisability of controlling private laboratories, and the method of your preference.

Thirty-six states responded to the request for information. The following table indicates the conditions in the various parts of the country:

No laboratory control necessary	12 states
Laboratory control unnecessary at present but advisable in near future	8 states
Laboratory control necessary but not yet accomplished	10 states
Laboratory control already in operation	6 states

CONTROL UNNECESSARY

Reports from the following states indicated that conditions were such that any control of laboratories doing private work was unnecessary:

Florida	South Carolina
Nebraska	Vermont
Delaware	Rhode Island
New Mexico	Arkansas
Oklahoma	Nevada
Kentucky	Indiana

It will be noticed that most of these are states with smaller populations, where there are but few private laboratories existing and where it is possible for the director of the state laboratory to be personally acquainted with the directors of each of the private laboratories. Such a condition is quite ideal since coöperation is much more easily obtained.

CONTROL AT PRESENT UNNECESSARY BUT DESIRABLE IN THE NEAR FUTURE

The following states reported that the private laboratories in each of their territories at the present time were doing good work as far as was known, but in the near future it would, without doubt, be necessary to take some steps in controlling or regulating the activities of such laboratories:

Missouri	New Hampshire
Colorado	Massachusetts
Ohio	Virginia
Georgia	Maryland

Great caution was advised by most of the laboratory directors in these states. While some preferred legislation as the best means of solving the problem, most were of the opinion that such methods would stir up too much antagonism and that some coöperative plan between the state department of public health and the laboratory workers would obtain the best results. Several suggested the certificate plan.

CONTROL NECESSARY BUT NOT YET ESTABLISHED

Reports from the following states indicate that some method of laboratory control is necessary, but as yet has not been accomplished:

Iowa	Alabama
Maine	Michigan
Minnesota	Oregon
Utah	West Virginia
Pennsylvania	Mississippi

In two states (Michigan and Pennsylvania) legislation was recently initiated looking towards the licensing of laboratory workers.

In Michigan such workers were divided into four groups:

1. Clinical Pathologist
2. Serologist
3. Bacteriologist
4. Chemist.

In each group were subdivisions of laboratory assistant and technician. After examination by the State Board of Registration, properly qualified individuals were to be registered as licensed laboratory workers in Michigan. The bill created considerable opposition and was eventually withdrawn.

In Pennsylvania a law was formulated for a somewhat similar scheme of licensing laboratory workers, but so much opposition was shown that the bill was never introduced into the legislature. The other eight states differed in opinions from laws requiring the licensing of laboratory workers to the "inducement of reward for coöperation rather than a penalty for not meeting the requirements." Opinion between the two methods was about equally divided in this group.

CONTROL ESTABLISHED

Reports from six states indicated that means were at hand for control of laboratories to a greater or less degree:

Wisconsin	California
New Jersey	Connecticut
Kansas	New York

Illinois, as previously mentioned, licenses persons to perform the Babcock test. Seven branch laboratories are operated for diphtheria work, but control of such laboratories is not extended to

other procedures. The Illinois Public Health Laboratory Association, formed to promote the reliability of laboratory examinations, is an extra-governmental agency.

In Wisconsin the State Board of Health subsidizes various laboratories, thus giving the control of such laboratories to the state. This is not extended to all state laboratories, however.

New Jersey has a provision in the Sanitary Code authorizing the inspection and supervision of laboratories doing public health work, but due to insufficient personnel such inspection is not carried out.

Kansas reports the organization of the Kansas Medical Laboratory Association. A committee of this association draws up standard laboratory methods which are accepted by the State Board of Health. The association requested that the State Board of Health certify laboratories that are properly qualified. The condition is rather ideal in that the process of standardization and certification has been initiated by the laboratory workers themselves, who are continually striving to improve the reliability of laboratory work.

In California a new set of regulations has just been completed and is about to be issued requiring that laboratory examinations for certain diseases shall be made only in laboratories approved by the State Board of Health. It is proposed to follow the practice of New York State, certifying laboratories after receipt from them of an application setting forth their equipment and the qualifications of their director and other workers.

In Connecticut the Sanitary Code empowers the State Health Officer to examine and approve laboratories doing public health work. All such laboratories, except those operated by physicians for their personal convenience, shall register annually. Further, they must report daily their findings as to the prevalence of communicable diseases, giving the names and addresses of patients.

In New York State the Commissioner of Health has supervision over local laboratories, as provided by the Sanitary Code. The law places the responsibility for the submission of certain specimens relating to public health upon the practicing physicians and health officers, and there is nothing in any law or regulation which requires laboratories to have the approval of the State Commissioner of Health in order to make the examinations. Approval and certification is made highly desirable, however. After inspection, approval is given upon condition that certain standard methods shall be carried out. About one hundred laboratories have been thus certified.

SUMMARY AND CONCLUSIONS

In reply to a questionnaire sent to the director of laboratories in the department of public health in forty-seven states, thirty-six replies were received. In twelve states it was reported that conditions were such that no control of private laboratories was necessary; in the other twenty-four states control was deemed advisable and necessary immediately or in the near future. In six of the latter group available machinery was at hand for control to a greater or less extent, while in the other eighteen no control measures had yet been determined upon, although in more than half there existed an immediate need of some method of laboratory control.

It is interesting to note that at the present time compulsory registration of laboratory workers is being enforced in none of the states with the exception of persons making Babcock tests in Illinois. Recently legislation was initiated in two states requiring compulsory examination and registration of laboratory workers, but so much opposition developed that the measures were withdrawn. It seems to be the consensus of opinion that such action is too drastic and is undesirable, although it was the method of choice of four laboratory directors.

The most popular method of control

is that already in operation in New York, where the State Department of Health certifies laboratories after inspection. Such certification is not necessary for the existence of any laboratory, but is, of course, eminently desirable. Standard laboratory methods are used, while frequent inspections and checks enable such laboratories to remedy any inaccuracies that may creep into the routine.

The Kansas plan is not dissimilar to the New York method except the laboratory workers themselves have taken the initiative and set their own standards which the State Board of Health has agreed to accept. The Kansas Medical Laboratory Association also has requested the State Board of Health to certify those laboratories which were found to be reputable after inspection. This is being done.

It would seem therefore that some method of control of laboratories doing public health or medical laboratory work is not only desirable, but practical. Such control should not be compulsory, however, but should be made as desirable as possible for the laboratories to come under. A state laboratory association is of distinct benefit from many standpoints, not the least of which is that the members get acquainted and "work in reasonable amity instead of enmity."

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MUNICIPAL MEAT INSPECTION

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Read before the Food and Drugs Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, October 20, 1924.

IT TOOK fifteen years of untiring effort before we finally succeeded in establishing in Utica a satisfactory system of municipal meat inspection. We now confiscate over 200,000 pounds of food products—meats; make over 6000 inspections of markets, stores and killing places where meat products are kept; inspect about 7500 vehicles which bring meat products to our stamping station, where they must be stamped before they may be offered for sale. No meat products are offered for sale unless stamped by the government, state or some municipal stamp.

I am trying now to have a public abattoir established in order to concentrate the killing within our city health department's jurisdiction. This would greatly increase our work, and also increase the amount of condemned products. With this addition, I should consider our meat inspection service equal to the best.

A license fee of $1.00 per year is charged any person or persons handling meat products, fish or poultry, and this is turned over to the city treasurer. Our department consists of a veterinarian in absolute charge, an assistant veterinarian, and five lay inspectors. One of these is in charge of the stamping station, which is open from 8 to 11 A.M. and 2 to 4 P.M. We have two thriving packing companies in our city. Previous to our having an established meat inspection service, these companies were greatly handicapped in regard to selling their products, as various cities refused to accept their products due to the fact that there was no municipal meat inspection in our city.

One of my first official acts was to try to right this condition of affairs. Representatives of these various cities who objected to our lack of inspection were invited to inspect our packing plants under the new ordinances. This they gladly

did, with the result that the former orders were rescinded and the products were allowed to be disposed of in their cities, much to the advantage of the packing companies. The packers also pay a certain sum over to the city treasurer for services rendered by the city.

We have very little trouble with dealers in regard to living up to our requirements. We try to work along the lines of education. Very few court cases come up, and if we do happen to have one and have to go before the city judge, we have a good case and take no chances. We are sure we are right and then go ahead. The local press has been a great asset to our work, and the city government stands back of us, endorsing our activities. Politics plays practically no part in the workings of our departments.

We follow the rules of the Order of the Bureau of Animal Industry No. 211, on the federal meat inspection law. Consequently our city government stands back of our stamps when placed on meat products. That which is condemned goes to the fertilizing tank, and no fee is accepted for it.

We are far behind some foreign governments in this phase of public health work. All slaughtering houses abroad are under state or municipal control, and ante- and post-mortem inspection is required of all animals used for food purposes. By these methods the elimination of all cold slaughtering of animals is positively enforced. By cold slaughtering I mean the fraudulent use of carcasses of dead, unslaughtered animals for human consumption. This frequently happened in our city before the meat inspection ordinance was put into effect. What happened in one city can happen in another city where there is no meat inspection law. The products from such unlawful vendors were sold to the poorer class of people directly, at a very low price.

This is one phase of public health activities in Utica, but it emphasizes the fact that the time has come when the health worker who does not avail himself to the fullest extent of the assistance offered by his veterinary colleagues, is neglecting an opportunity of great potentialities, not only because of the intercommunicability of many animal and human diseases, but also because by the study of the analogies between the pathological processes of man and those of the lower order much knowledge may be gained which may be employed in the protection of the human species.

Not only is the trained veterinarian assisting in the solution of many problems of human pathology through research into the diseases of animals, but he may also be of incalculable value in preventing the spread of communicable diseases of animal to man by collaboration and interchange of thought. The medical and veterinary professions will benefit mutually, and the veterinarian will prove a valuable ally to the health worker.

As a matter of fact, the eradication of several diseases common to man and animal rests in the final analysis with the veterinary scientist. It is, therefore, not merely as an inspector of meat that the veterinarian serves in the public health campaign.

Pasteur in closing his oration on the opening of the Pasteur Institute in 1888, said "There are two opposing laws, contesting one with the other. The one is a law of blood and death, opening each day new methods of destroying life; the other a law of health. Its only aim is to deliver mankind from the enemies that assail him." God only knows which of these two laws will gain the upper hand. Now it is up to us as guardians of the health of mankind as well as animals to use every means at our disposal to help enforce the law of health.

THE DICK TEST AND ACTIVE IMMUNIZATION WITH SCARLET FEVER STREPTOCOCCUS TOXIN

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AN IMPORTANT step in the final control of scarlet fever has been the recent work of the Dicks,[1] who definitely identified the hemolytic streptococcus associated with scarlet fever as the causative agent of the disease. They were able to produce experimental scarlet fever in human beings by planting upon the naso-pharyngeal mucous membrane of several volunteers a culture of the hemolytic streptococcus, which was obtained from the infected finger of a nurse taking care of cases of scarlet fever.

Their work and that of different investigators who claimed that the specific hemolytic streptococcus of scarlet fever formed a single agglutinative group, turned the attention of the medical profession once more toward this organism as the primary cause of scarlet fever. Among these observers may be mentioned Gordon,[2] Bliss,[3] Tunicliff,[4] and Dochez.[5] Williams of the Research Laboratory and the Dicks,[6] on the other hand, found that the different scarlet fever strains fell into different agglutinative groups.

With the identification of certain strains of the hemolytic streptococcus as the specific agent of scarlet fever, the Dicks continued their investigations and obtained a soluble toxic filtrate [7] from cultures of this organism, which gave positive skin reactions in early cases of scarlet fever and negative reactions in convalescence. Positive and negative reactions were also observed in normal individuals.

Zingher [8, 9, 10, 11] has confirmed and extended the observations of the Dicks on the skin test. Branch and Edwards [12] also confirmed the results of the Dicks. With the toxin the Dicks [13] have succeeded in immunizing actively a number of nurses. Zingher [10, 11] injected with gradually increasing doses of the toxin the positive reactors in a number of schools and institutions.

An antitoxic serum has also been produced by the Dicks [14] by injecting the toxin into horses. Dochez [15] a few months earlier obtained an antitoxic serum by a different method. He first injected a small amount of liquefied agar into the subcutaneous cellular tissue of the neck of a horse, and into the center of the agar nodule formed after its solidification he inserted the sedimented bacterial mass from a broth culture of the scarlatinal streptococcus. The bacteria were thus protected from the phagocytes, while the toxin according to Dochez could pass through the agar into the lymph spaces and cellular tissues of the animal and stimulate the production of antitoxin. A sloughing ulcer is formed at the site where the agar and bacteria have been injected. Very good therapeutic results have been claimed for the Dochez serum by Blake, Trask and Lynch.[16] At the Willard Parker Hospital the Dochez serum has given encouraging results, but not so striking as those reported by Blake and his associates.

MODERN CONCEPTION OF SCARLET FEVER

The absence of immunity after various infections with the hemolytic streptococcus has always been a strong point against accepting this organism as the specific etiological agent of scarlet fever. With the separation and identification of a toxin produced by the scarlatinal streptococcus

our conception of scarlet fever and the immunity following it have undergone a considerable change. We now consider the disease a local infection of the mucous membrane of the naso-pharynx in which a soluble toxin is produced. This is absorbed into the system of the patient, where it gives rise to the rash and other constitutional symptoms.

The disease thus resembles to a certain extent diphtheria. It differs, however, from diphtheria in that the toxin stimulates the production of an antitoxic immunity in nearly all patients and in the tendency of the hemolytic streptococcus to invade the body and produce gland, ear and joint infections. The immunity, therefore, to scarlet fever is chiefly *antitoxic* and not antibacterial, since patients who have recovered from scarlet fever either recently or in previous years may develop infections with the specific scarlatinal organism. These reinfections are not associated, however, with the characteristic clinical criteria of scarlet fever, a rash followed by desquamation. Similar infections without a rash may also occur in those who are "naturally" antitoxically immune to clinical scarlet fever and give a negative Dick reaction.

THE DICK TEST

The Dick test in relation to scarlet fever closely resembles the Schick test in relation to diphtheria. It consists of the intradermal injection of 0.1-0.2 c.c. of a dilution of the soluble toxic filtrate obtained from a culture of the specific hemolytic streptococcus. The toxin is made by growing the streptococcus for five to six days in broth containing five per cent defibrinated or citrated horse blood. Carbolic acid is then added to the broth culture in the proportion of 0.5 per cent, the sediment formed allowed to settle and the supernatant fluid passed through a Berkefeld filter. A good toxin should give, in a dilution of 1:1000 strong positive as well as negative reactions when tested in a group of young children.

The diluted scarlet fever toxin is more stable than the diluted diphtheria toxin used in the Schick test. It can therefore be distributed ready for use. A definite standard has not yet been established for the scarlatinal toxin. It cannot be standardized in animals as it has very little effect on rabbits and practically no effect, even in the undiluted form, on guinea pigs and mice. The following method of standardizing a toxin will be found suitable until a better one is developed. The toxin is standardized by finding a dilution which gives negative reactions in convalescent cases of scarlet fever and good positive (++) reactions in young and susceptible children. It should be emphasized that with a sufficiently low dilution of a toxin, a positive reaction can be brought out in every patient convalescent from scarlet fever. Having established the strength of a standard toxin, it becomes an easy matter to compare by intradermal tests in the same susceptible individual the strength of a newly prepared toxin with that of the standard.

A control test with diluted toxin which has been heated in a waterbath at boiling temperature for an hour should be made at the same time that the test is carried out. The control enables us to differentiate with a fair degree of accuracy the four different reactions already well known in connection with the Schick test: the positive, the negative, the negative-pseudo and the positive-combined reactions.

The *positive* Dick reaction appears more rapidly than the positive Schick reaction. Within 8 to 12 hours one can tell by the result of the test who is susceptible and who is immune to scarlet fever. At the end of 18 to 24 hours the positive Dick reaction resembles closely the positive Schick reaction which has reached its maximum intensity on the fourth day. The Dick reaction, however, fades much more rapidly, only the more strongly positive reactions showing a slight brownish pigmentation at the end of 7 to 10 days. Desquamation is rare, and if

present is very slight. The positive reactions are read as strongly positive (++) when there is a marked redness and local induration; positive (+) when there is local redness with little or no induration; moderately positive (±) or slightly positive (±) depending on the size and degree of redness in the reaction.

The *negative* reaction shows no change at the site of the test or control.

The *negative-pseudo* reaction shows the same appearance in the test and control. These reactions are due to a protein hypersensitiveness to the autolyzed substance of the hemolytic streptococcus and to the other proteins contained in the test fluid.

The *positive-combined* reaction represents a combination of the positive and negative-pseudo reactions. The reaction in the test with the unheated toxin is usually more pronounced than in the control with the heated toxin.

The positive and positive-combined reactors are susceptible to scarlet fever as far as not having antitoxin is concerned. The negative and negative-pseudo reactors have antitoxin in their blood and are immune to the toxic effects of the scarlatinal streptococcus.

The presence of antitoxin in blood serum (human or horse) can be shown in one of two ways: (1) The serum added to a toxin dilution double the strength used for the Dick test will neutralize the action of the toxin so that no reaction will be produced when the mixture is injected intradermally into a susceptible person; (2) the serum injected in a dose of 1.0 c.c. intradermally into the rash of an early case of scarlet fever will blanch the rash out over an area the size of a twenty-five cent piece to that of a silver dollar (Schultz-Charlton phenomenon).

RESULTS WITH THE DICK TEST IN NORMAL PERSONS

Table 1 shows the results with the Dick test in 7700 persons of different ages. The percentages closely resemble those noted with the Schick test in the same groups. These tests were made in public schools, institutions and hospitals.

TABLE 1

THE DICK TEST AT DIFFERENT AGE GROUPS

Age	Total Tested	Dick Positive	Dick Negative	Per Cent Dick Positive
0–6 months	29	13	16	44.8
6–12 months	52	34	18	65.3
1–2 years	233	167	66	71.6
2–3 years	204	131	73	64.2
3–4 years	241	146	95	60.5
4–5 years	264	128	136	48.4
5–10 years	1955	678	1277	33.6
10–15 years	2965	677	2288	22.8
15–20 years	981	166	815	16.8
20 years up	776	112	664	14.4
Total	7700	2252	5448	29.2

In two private schools, attended by children of the well-to-do classes of the city's population, we found that 83 per cent of 320 children were susceptible to scarlet fever. A similar high susceptibility to diphtheria we had previously found with the Schick test [17] in the same class of children. Nurses in training schools and students at Teachers College, Columbia University, gave from 40 to 70 per cent positive Dick as well as positive Schick reactions. Many of these individuals came from smaller communities, where they had had but little exposure to infection with the organisms of scarlet fever and diphtheria.

The antitoxic immunity to scarlet fever is transmitted from mother to offspring through the placenta just as it is transmitted in the case of diphtheria. At birth infants show slightly positive or negative reactions when their mothers give respectively positive or negative reactions. The antitoxic immunity persists in those infants for five to six months and is then gradually lost, a large proportion of the children becoming susceptible to scarlet fever at the end of the first year of life.

Several groups of children and adults were tested with both the Dick and Schick tests. The results indicate that two-thirds of the tested gave positive reactions to both tests or negative reactions to both. In groups where the posi-

TABLE 2. SUMMARY OF RESULTS WITH DICK TEST IN ACUTE AND CONVALESCENT CASES OF SCARLET FEVER.

1. Results of First Dick Test on Scarlet Fever Patients at the Time of Admission to Hospital.

Number days of illness before Dick test.	Reaction					Number Tested	Total Number Dick Positive	Per Cent Dick Positive
	++	+	±	∓	—			
1-5	10	83	97	7	4	201	197	98.0
6 days and over	0	0	9	7	64	80	16	20.0

2. Patients Receiving Dick Test During Acute Stage and During Convalescence from Scarlet Fever.

a)	Total number tested	232
b)	Total number Dick positive on admission to hospital and Dick **negative** during convalescence	213
c)	Total number Dick positive on admission to hospital and Dick **positive** during convalescence	19
d)	Per cent giving negative Dick reaction during convalescence from scarlet fever	91.3

3. The Dick Test and Schultz-Charlton Phenomenon in Scarlet Fever.

Test	Days of Illness.			
	1-4 days	5-7 days	8-10 days	11-15 days
Dick test	+ or ±	±, or ∓ or —	∓ or —	—
Schultz-Charlton	—	— or ±	± or +	+

tive Dick reactions predominated, a large proportion was found to be positive to the two tests, and where the negative Dick reactions predominated the reverse was found to be the case. The other third of the tested who had different reactions was about evenly divided into two groups: (a) those who gave a positive Dick and a negative Schick reaction, and (b) those who showed a negative Dick and a positive Schick reaction.

RESULT WITH THE DICK TEST IN SCARLET FEVER

Table 2 gives a summary of the results obtained with the Dick test during the past six months among the scarlet fever patients admitted to the Willard Parker Hospital. It will be seen that of 201 patients who were tested during the first five days of illness 197, or 99 per cent, gave positive reactions. These reactions were in the majority of cases + or ±. Strongly positive reactions (++), as seen in normal persons, are not as a rule observed in scarlet fever cases. In most cases some antitoxin has already developed by the second or third day of rash, at a time when many of the cases are usually admitted to the hospital. Of 80 patients tested on admission with a history of six days or more of illness, 64, or 80 per cent, gave negative or negative-pseudo reactions.

Of 232 patients who were tested on admission and also during convalescence 213, or 91.3 per cent, showed a positive reaction on admission and a negative reaction during convalescence. Of the 19 patients who gave a positive reaction during convalescence also, two evidently had had no scarlet fever on admission to the hospital, as they developed the disease five days later and subsequently showed a negative Dick test. Twelve of the remaining 17 patients did not desquamate. It was interesting to note that though 6 of these 12 continued to show a strong positive (++) reaction, indicating that they probably did not have scarlet fever on admission, yet none developed a scarlatinal rash during their stay in the hospital. These patients, although susceptible to the toxin, were probably protected by a local tissue resistance of the nasopharyngeal mucous membrane, which prevents the invasion and toxic action of infectious organisms even in the absence of a general antibody immunity. This local defense mechanism, however, can probably be destroyed by an inflammatory process, such as a cold, or by an operative procedure, such as removal of the tonsils and adenoids.

Five of the patients who continued to show a moderately positive reaction during convalescence desquamated. In two

the desquamation was not characteristic. In one of these two patients it was patchy, confined to parts of arms, shoulders and chest, and left behind it eczema-like areas of skin; in the other slight desquamation was noted on one hand only.

The important question arises whether we are dealing in scarlet fever with one or several different toxins produced by the different agglutinative strains of the specific hemolytic streptococcus. The negative Dick reactions in most of the convalescents from scarlet fever point at least to a great majority as producing a single toxin, such as we know in diphtheria and tetanus. The few positive reactions during convalescence were noted in cases in most of which there can be serious doubt as to the correct diagnosis of scarlet fever. The few patients who desquamated and yet gave a positive Dick reaction during convalescence leave two possibilities open: Either the amount of antitoxin produced during the course of the disease was not sufficient to neutralize the action of the toxin in the Dick test, or there may be occasional strains of hemolytic streptococcus causing scarlet fever that make different toxins, as in the case of *Bacillus botulinus*, which produces two different soluble toxins.

The third part of Table 2 shows that the Dick reaction becomes negative from the sixth to the tenth day of illness. This corresponds with the appearance of antitoxic antibodies in the patient's blood. With the presence of antitoxin the serum acquires the property of blanching the rash (Schultz-Charlton phenomenon) in an early case of scarlet fever. This is indicated in the table by the plus signs. It was significant to note that the Dick reaction became negative a little earlier in convalescence, showing that it requires a certain concentration of antitoxin before the patient's serum can blanch the rash. The Schultz-Charlton test is a rather crude method for the quantitative determination of antitoxin in blood serum as it requires not only a definite concentration to produce a permanent blanching, but many scarlatinal rashes are unsuitable for this test. It is of value, however, as a diagnostic measure to be carried out with a known antitoxic serum in a doubtful case of scarlet fever. Suspicious rashes, especially if well pronounced but not characteristic, could be thus accurately diagnosed. The fine pinpoint rashes do not show the blanching well.

An interesting and significant appearance was noted at the site of the original Dick test in two patients who developed scarlet fever one week after the test. The area on the forearm corresponding to the previous reaction was very pale and surrounded by a sharply defined ring of the scarlet fever rash which was greatly intensified in redness when compared with the rest of the eruption on the forearm. During the height of the eruption a second Dick test was made over the pale area and another one a little to one side. The reaction which developed within the pale area was very slight when compared with the second reaction alongside of it. Apparently a certain amount of cellular immunity had developed at the site of the original positive Dick test. This gave rise to the appearance of the local pallor, which presented such a striking contrast to the rest of the blushed skin and also prevented the development of a good positive reaction during the first day of the disease. The ring of intensified rash making up the border which surrounded the pale area was probably due to the interaction between cells which were sensitized rather than protected by the minute antibody content within their substance and the scarlet fever toxin of the disease. These observations point to the probable local origin in the epidermis of some antitoxin production against scarlet fever.

IMMUNITY RESULTS WITH SCARLET FEVER TOXIN

A convenient method for determining the amount of toxin for active immunization is the skin test dose. The dilution to be used for this purpose depends on the strength of the toxin. If it is used for the Dick test in a dilution of 1:1000, then

1 c.c. of a 1:100 dilution represents 100 skin test doses, the initial dose for active immunization. The second dose is 250 and the third dose 250 skin test doses for children under 3 years. For children over 3 years and up to 12 years the third dose is gradually increased to 500 skin test doses. For adults the third dose may be increased to 1000 skin test doses. In making the dilutions for injecting larger numbers we add 1 c.c., 2.5 c.c. or 5 c.c. of undiluted toxin to 100 c.c. bottles of salt solution, or one-half these amounts to 50 c.c. bottles of salt solution. Where only a few doses are to be administered it is most convenient to make a dilution of the toxin 1:20 which represents 500 skin test doses per c.c. Depending on the age of the person, 0.2 c.c., 0.5 c.c. and 0.5 or 1.0 c.c. would represent the corresponding three doses with this toxin dilution. The injections are given intramuscularly or subcutaneously 7 to 10 days apart.

Local reactions such as slight to moderate redness, induration and tenderness follow as a rule, although they are more frequently seen in older children and adults. The local reactions resemble in degree those noted after the use of 1/10 L + mixtures of diphtheria toxin-antitoxin.

Constitutional reactions are occasionally seen but they are rather infrequent if the initial dose as recommended is a small one and the amount of toxin is gradually increased. The symptoms develop after 12 to 24 hours and consist of varying degrees of temperature, a slight sore throat and occasionally a scarlatiniform rash, that may persist for 24 to 48 hours.

In one adult the rash was followed by desquamation of the palms of the hands. Of more than 2000 children and adults injected with the toxin only 10 had constitutional symptoms associated with a rash, and of these 6 were children under one year of age who had received 100 skin test doses as the initial injection.

These constitutional reactions are not serious, being seen only in persons who are unusually susceptible to the effects of the toxin, yet it would seem desirable to avoid them. For this purpose the toxin can be purified according to the method of Huntoon,[18] which consists in precipitating the toxin with 20 per cent sodium chloride and 1 per cent acetic acid. It is then treated with formaldehyde according to the method suggested by Ramon[19] and by Glenny and Hopkins[20] for diphtheria toxin. This consists in adding 0.1 per cent formaldehyde (0.25 per cent commercial formalin) to a toxin containing from 2 to 5 mgm. amino-nitrogen per 10 c.c., as determined by the van Slyke method, and allowing the toxin to remain at incubator temperature for 4 to 5 weeks. In this way the attempt is made to obtain a modified toxin or toxoid, that will retain its immunizing value and can be used in larger doses without producing constitutional symptoms.

We have found that scarlet fever toxin is neutralized in multiple proportions by

TABLE 3. IMMUNITY RESULTS WITH SCARLET FEVER TOXIN

DOSES GIVEN: Under 12 Years. 100, 250 and 250 skin test doses at weekly intervals.
Over 12 Years. 100, 250 and 500 skin test doses at weekly intervals.
DICK RETEST AFTER 4-5 WEEKS.

Institutions	Per Cent Positive Dick at Original Test	Dick Positive and Combined.				Dick Negative and Pseudo.	
		Total Retested	Number Positive as in Original Test	Number Less Strongly Positive	Per Cent Less Strongly Positive	Number	Per Cent
Hebrew Orphan Asylum	29.2	143	19	20	**14.0**	104	72.7
New York Orphanage	44.4	91	10	36	**39.5**	45	49.4
Leake and Watts Home	22.0	40	12	10	**25.0**	18	45.0
Total		274	41	66	**24.0**	167	61.0

the antitoxin. Mixtures of toxin-antitoxin could, therefore, also be prepared similar to the ones used for diphtheria immunization.

Table 3 shows the results with the Dick retest among the children of three institutions, who were injected with the scarlet fever toxin. The retests were made 4 to 5 weeks after the immunizing injections. Sixty-one per cent of the retested children gave negative reactions, and of these a large majority showed negative-pseudo reactions. An additional 24 per cent gave reactions that were less strongly positive than in the original test. The immunity results obtained after the injection of toxin became difficult of interpretation on account of the numerous pseudo-reactions noted in the retest. This can be avoided to a certain extent by using the purified toxin for the Dick test.

ACTIVE IMMUNIZATION OF YOUNG CHILDREN

During the past summer we have injected about 2000 children under the age of 6 years in the Baby Health Stations of Manhattan and the Bronx. These children were injected without a preliminary Dick or Schick test against scarlet fever and diphtheria. The results will be noted by following the cases of scarlet fever and diphtheria developing during the coming year and checking them up against an alphabetical card index list of the injected children.

Each child received 3 doses of scarlet fever toxin and 3 doses of a 1/10 L + mixture of diphtheria toxin-antitoxin, one arm being used for the scarlet fever, the other one for the diphtheria inoculations. It is important to note that the local reactions in these young children are as a rule quite mild. If parents realized this fact thoroughly they would be willing to have their children immunized against these two diseases before they enter school.

SCARLET FEVER ANTITOXIN

Dochez, as well as the Dicks, has described the successful production of an antitoxic serum in horses. Such sera are being prepared at the present time by a number of biological laboratories, including our own, and a concentrated serum will probably be available within a few months. The antitoxin can be used for prophylaxis and treatment along the lines so successfully carried out with diphtheria antitoxin. The dose recommended for purposes of passive immunization is 10 c.c. and for treatment from 20 to 50 c.c. The serum injections are best given intramuscularly.

Where animal antitoxic sera are not available good results will be obtained with the serum or citrated whole blood from convalescents as well as from negative Dick reactors. In testing quantitatively normal individuals by the intracutaneous test with increasing concentrations of scarlet fever toxin I found that some of them show even larger amounts of antitoxin than convalescents.

The effect of antitoxic serum in the treatment of scarlet fever is best seen in the more severe toxic cases that have no septic complications, such as sloughing fauces and enlarged cervical glands. There is a rapid, almost critical drop in temperature, an improvement in the character of the pulse and respiration and more rapid fading of the rash. The improvement in the clinical picture of toxic cases I described a number of years ago[21] after the use of intramuscular injections of citrated convalescent and also of normal blood. There is a similar improvement after the injection of antitoxic horse serum.

SUMMARY AND CONCLUSIONS

1. The Dick test is a reliable method for determining susceptibility and immunity to scarlet fever. In our experience with the test in over 7700 cases, up to the present time 8 positive reactors and none of the negative reactors have developed scarlet fever.

2. The Dick test helps in the diagnosis of doubtful cases of scarlet fever. A strongly positive (++) reaction early in

the disease and again later in convalescence speaks against the diagnosis of scarlet fever. A definite negative reaction during the first two days of rash should also put one on guard that he may not be dealing with scarlet fever.

3. Active immunization with scarlet fever toxin is a safe procedure and is not to any extent associated with the development of constitutional symptoms if the dose of toxin is gradually increased. The skin test is a convenient method for measuring the amount of toxin. Three doses are given at intervals of 7 to 10 days. For children under 3 years, the doses are 100, 250 and 250 skin test doses; over 3 years and up to 12 years the third dose is gradually increased to 500 skin test doses. For adults the third dose may be increased to 1000 skin test doses. A large proportion of the successfully injected individuals show a negative or a negative-pseudo reaction at the retest.

4. Purification of the toxin by the sodium chloride and acetic acid precipitation method gives a preparation that is better for the Dick test and for active immunization, because of lesser protein reactions.

5. The use of toxin treated with formaldehyde to make it practically non-toxic and of toxin-antitoxin mixtures represent further steps in the development of active immunization against scarlet fever.

6. The Dick test applied to 232 cases of scarlet fever showed that 91.3 per cent gave positive reactions during the early stages of the disease and negative reactions during convalescence. There were 19 patients who gave a persistent positive reaction; of these 2 developed scarlet fever subsequently. Of the remaining 17 patients 12 did not desquamate.

7. It is probable that most of the strains of the scarlatinal streptococcus produce a single toxin. The few cases that show positive Dick reactions in convalescence and yet desquamate point either to an insufficient amount of antitoxin in the patient's blood and tissues to neutralize the action of the toxin in the Dick test or to the production of more than one toxin by a few exceptional strains of the scarlatinal streptococcus.

8. The scarlet fever toxin is neutralized in multiple proportions by the antitoxin.

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MILK-BORNE DISEASE IN MASSACHUSETTS

THIRD CHRONOLOGICAL REPORT FROM THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

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THE FIRST attempt to evaluate the relative importance of milk as a cause of disease transmission in Massachusetts was embodied in the Report of the Special Milk Board of the Massachusetts Department of Health in 1915. Apparently this was one of the earliest attempts in public health literature to seek quantitative values regarding milk as a source of infection in the common communicable diseases in which milk is a factor. The data published in that report were summarized and discussed in a paper by Kelley in 1916.[1] The period of time covered was nine years (1907–1915, inclusive).

In 1919 Kelley and Osborne collected and tabulated data on milk-borne infection in Massachusetts together with an estimate of the proportion of milk pasteurized in certain cities comprising 61 per cent of the state population. Their results were published in 1920.[2] The period of time covered in the report was four years (1915–1918, inclusive). Tables published in these two former reports are reproduced herewith for comparison.

With the object of bringing up to date the available material on milk-borne disease and pasteurization in Massachusetts, the data submitted herewith were collected and tabulated.

The list of outbreaks of milk-borne disease for the five years, 1919–1923, inclusive, is based on investigations made by this department. Cases finally classified as due to milk infection are tabulated for comparison with all reported cases of typhoid, septic sore throat, scarlet fever and diphtheria for the three time periods involved in this and the two previous reports. (Table I.) The marked reduction noted in the proportion of reported cases of these four diseases traced to milk is associated with a continued prevalence of scarlet fever and diphtheria. Reported cases of typhoid and septic sore throat have fallen off considerably. It has always been department practice to consider milk as a possible source of infection in outbreaks of these diseases, and not to discard it as a possibility until it can be definitely ruled out. Epidemiological reports on all outbreaks traced to milk are carefully collected and filed.

TABLE I

PROPORTION OF CASES OF TYPHOID, SEPTIC SORE THROAT AND DIPHTHERIA TRACED TO MILK, SINGLY AND COMBINED

Disease	1907-1915			1915-1918			1919-1923		
	Cases Reported	Traced to Milk	Percent	Cases Reported	Traced to Milk	Percent	Cases Reported	Traced to Milk	Percent
Typhoid Fever	23,482	2,215	9.43	6,331	496	7.83	4,105	297	7.23
Septic Sore Throat	*	2,512	....	1,401	867	61.88	829	118	14.23
Scarlet Fever	70,569	2,747	3.89	25,328	140	.55	46,777	53	.11
Diphtheria	69,646	131	0.18	33,807	30	.08	42,386	8	.018
	163,697	7,605	4.64	66,867	1,533	2.29	94,097	476	.505

*Not reported until 1915.

To evaluate properly the data presented in this report, it is necessary to consider the following facts:

1. Milk-borne disease is not reportable in Massachusetts.
2. Milk-borne disease is not recognized by physicians as frequently as it occurs.
3. Milk-borne disease is not investigated by boards of health as frequently as it occurs.
4. Milk-borne disease is not traced to milk as frequently as it is investigated.
5. Milk-borne disease is not traced to milk as frequently as it occurs.

TABLE II

PROPORTION OF CASES OF EACH MILK-BORNE DISEASES TRACED TO MILK AGAINST CASES OF ALL MILK-BORNE DISEASES TRACED TO MILK

Disease	1907-1915		1915-1918		1919-1923	
	Cases Traced to Milk	Percentage of all Cases Traced to Milk	Cases Traced to Milk	Percentage of all Cases Traced to Milk	Cases Traced to Milk	Percentage of all Cases Traced to Milk
Typhoid Fever	2,215	29.13	496	32.36	297	62.40
Septic Sore Throat	2,512	33.03	867	56.56	118	24.80
Scarlet Fever	2,747	36.12	140	9.13	53	11.12
Diphtheria	131	1.72	30	1.95	8	1.68
	7,605	100.	1,533	100.	476	100.

TABLE III

OUTBREAKS TRACED TO MILK INFECTION

Disease	1907-1915		1915-1918		1919-1923	
	Outbreaks Traced to Milk	Percent	Outbreaks Traced to Milk	Percent	Outbreaks Traced to Milk	Percent
Typhoid Fever	50	69.45	16	57.14	12	70.59
Septic Sore Throat	7	9.72	7	25.00	3	17.65
Scarlet Fever	10	13.89	4	14.29	1	5.88
Diphtheria	5	6.94	1	3.57	1	5.88
	72	100.0	28	100.0	17	100.0

Table II illustrates the relative frequency of cases traced to milk of each of the four common milk-borne diseases, as compared to all cases traced to milk in each time period.

Table III deals with the relative frequency of outbreaks due to milk of each of the milk-borne diseases for each time period.

Data on pasteurizaztion for the year 1923 set forth in Table IV were obtained from replies to a questionnaire sent out from the department early in 1924. The questionnaire was sent to sixty-seven cities and towns over 10,000 population and replies were received from forty-one of these. The population in the forty-one cities replying to the questionnaire comprises 65 per cent of the state population. The accuracy of the data submitted in the replies as to the amount of milk sold daily and the amount pasteurized is admittedly open to question, as many of the replies gave round numbers only. This should be borne in mind when comparing the per capita daily consumption of milk for the years 1919 and 1923.

The information on pasteurization in

TABLE IV

1923*

	Number of Cities	Quarts Sold Daily	Quarts per Capita	Quarts Pasteurized	Percent Pasteurized	Population
Cities of 50,000 and Over	12	836,937	.46	688,975	82.25	1,821,344
Cities 25,000–50,000	10	212,164	.498	138,260	65.1	425,960
Cities 15,000–25,000	10	79,877	.382	34,583	43.4	209,110
Cities and Towns 10,000–15,000	9	42,768	.38	4,630	10.8	112,614
Total	41	1,171,746	.456	866,448	74.	2,569,028

1919**

	1,350,000	.556	460,000	34	2,425,950

*Questionnaires sent to 67 cities over 10,000 population.
Reply received from 41 cities.
Representing 65% of state population.
**Data for year 1919 are based on 61% of the state population.

1919 and 1923 was obtained by the same method, so that the factor of error may be reasonably constant in both figures.

DISCUSSION—TYPHOID FEVER

While the total number of outbreaks of milk-borne disease and of milk-borne typhoid have decreased considerably, typhoid holds the preëminent position among outbreaks of milk-borne disease. In the last five years typhoid was responsible for 12 out of 17 milk-borne outbreaks (70.5 per cent), as against 16 out of 28 (57.1 per cent) in the period 1915–1918 inclusive. Outbreaks of milk-borne typhoid characteristically occur on small unpasteurized milk routes. Since the explosive outbreak at Waltham in 1921 (135 cases), it has been observed that outbreaks of milk-borne typhoid have been limited to a small number of cases each, and for the most part have been confined to the smaller communities.

Of all cases of typhoid reported in the last five years, 297 (7.23 per cent) were traced to milk. This is practically the same proportion as in the preceding four year period (7.83 per cent).

In relation to all cases of milk-borne disease typhoid has gained the leading place, accounting for 297 cases out of 476 (62.4 per cent) in the last five years. Both as regards number of cases and number of outbreaks, typhoid is now the most common milk-borne disease.

SEPTIC SORE THROAT

In former reports septic sore throat has been described as the milk-borne disease par excellence. But there has been considerable apparent change in the relative importance of milk as a source of infection in septic sore throat since 1918, only 14.2 per cent of all septic sore throat cases reported being traced to milk in the last five years, as compared to 62 per cent in the four years previous. An explanation was sought for the fact that so large a proportion of septic sore throat cases reported were *not* traced to milk.

For the years 1922 and 1923 the cases reported were tabulated by weeks, together with the number of cities and towns reporting cases in the same period. Three hundred and twelve cases were reported in the two years from one hundred and eighty-seven towns (by weeks). The cases per town per week are 1.67, considerably less than 2. This illustrates the great scattering of cases reported. It is to be surmised from this that many if not most cases reported as septic sore throat are not connected with milk as a source of infection and perhaps not with hemolytic streptococci. For the two years 1922 and 1923, 75 cases, or 24 per cent of all cases reported, occurred in two well defined outbreaks traced to milk.

In the last five years typhoid fever and septic sore throat have changed places with regard to their relative importance as milk-borne diseases. In the period 1915–1918, inclusive, more than half (56.5 per cent) of all cases of disease traced to milk were cases of septic sore throat, while 32.4 per cent were typhoid. Since 1918, however, only 24.8 per cent of all cases traced to milk were septic sore throat and 62.4 per cent were typhoid.

Because of the scattering of cases, diagnosis of septic sore throat is apparently used for a different clinical entity than formerly when it was almost invariably associated with explosive multiple cases of acute pharyngitis.

SCARLET FEVER

Only one outbreak of scarlet fever traced to milk infection has occurred in the last five years. This outbreak accounted for 53 cases, or 0.110 per cent of all cases reported in the period, against 140 cases, or 0.55 per cent in the four years previous.

Of all cases of disease traced to milk scarlet fever was represented in 11.1 per cent in the five years just past. In the previous four year period 9.13 per cent were scarlet fever, and in the period 1907–1915, inclusive, 36.1 per cent.

LIST OF OUTBREAKS TRACED TO MILK IN FIVE YEARS 1919-1923 INCLUSIVE

Year	Month	Place	Disease	Cases	Source
1919	August	Gardner	Typhoid	8	Carriers
1919	Aug.-Sept.	Tewksbury and Lowell	Typhoid	14	Not Proven
1919	Oct.-Nov.	Princeton and Worcester	Typhoid	29	Carrier
1920	July	Chelsea	Typhoid	18	Not Proven
1920	Sept.-Oct.	Ipswich	Typhoid	33	Not Proven
1920	June-July	Winchester	Septic Sore Throat	43	Carrier—Milk Handler
1921	May	Waltham	Typhoid	135	Not Proven
1921	Sept.-Oct.	Milford	Typhoid	12	Not Proven
1921	Sept.-Oct.	Fitchburg	Typhoid	8	Carrier
1921	September	Natick and Sherborn	Typhoid	6	Not Proven
1921	April	Winchester	Diphtheria	8	Not Proven
1921	April	Williamstown	Scarlet Fever	53	Case in family of producer
1922	December	Milton	Typhoid	8	Carrier
1923	May	Arlington	Septic Sore Throat	68	Case in family of producer
1923	September	Newburyport	Typhoid	15	Not Proven
1923	Oct.-Nov.	Taunton	Typhoid	11	Carrier
1923	October	Harwich	Septic Sore Throat	7	Case in family of producer
				17	476

In importance as a milk-borne disease scarlet fever now comes third on the list, falling far behind typhoid and septic sore throat.

DIPHTHERIA

One outbreak of diphtheria traced to milk has occurred in the last five years, accounting for only 8 cases. As a milk-borne disease, diphtheria has not assumed serious proportions in Massachusetts as compared with typhoid, septic sore throat and scarlet fever at any time since 1907. In relation to all cases of disease traced to milk, diphtheria has always accounted for less than 2 per cent. The proportion has been nearly constant in all three reports.

Of all reported cases of typhoid, septic sore throat, scarlet fever and diphtheria in the last five years, only 0.5 per cent (476 cases) were attributable to milk infection, against 2.3 per cent (1533 cases) in the preceding four year period.

PASTEURIZATION

The data compiled from the forty-one cities and towns responding to the questionnaire show two things of importance:

First, is the great increase in the proportion of milk pasteurized in 1923 against 1919, the date of the last questionnaire. An increase from 34 per cent to 74 per cent is too large to be due to ordinary errors of observation or estimate when applied to approximately the same proportion of the state population.

Second, the striking variation is brought out between the proportion of milk pasteurized in cities over 50,000 population and in those between 10,000 and 15,000. This is especially significant in view of the fact that it is in the latter group where outbreaks of milk-borne disease are most prone to occur.

It may not be out of place to point out here that a significant change in the death rate from non-pulmonary tuberculosis took place about the year 1910, when pasteurization began to be introduced on a considerable scale in Massachusetts. Whereas, prior to 1910 the death rate from non-pulmonary tuberculosis showed little tendency to fall, since that date there has been a precipitous decline amounting to nearly 75 per cent.

The pulmonary death rate began to fall much earlier. The most rapid fall in the non-pulmonary death rate came while pasteurization was of academic rather than practical significance, and the rapidity of the fall has decreased as the percentage of pasteurization has increased, and, therefore, the fall in the non-pulmonary tuberculosis death rate and the rise in the proportion of milk pasteurized occurring in the same period may be coincidental.

DEATH RATE PER 100,000 POPULATION

Non-Pulmonary Tuberculosis—Massachusetts

Years	Average Death Rate
1905–1909	57.7
1910–1914	29.5
1915–1919	20.5
1920–1923	15.0

CONSUMPTION OF MILK

Estimates of per capita consumption of milk for 1923 given in Table IV show considerable variation between large and small cities. Cities over 50,000 population consume .46 quarts per capita daily, while cities and towns between 10,000 and 15,000 population consume only .38 quarts. More important still, the estimated consumption of milk for the total population of forty-one cities and towns has fallen in four years from .556 quarts per capita daily in 1919 to .456 in 1923!

If the estimates are in accord with the facts, it would seem that the rising price of milk has more than offset the efforts of hygienists and milk dealers to increase the consumption of milk.

1. Kelley, E. R. Milk-borne Infection. *Jour. A. M. A.*, 67:1997 (Dec. 30), 1916.

2. Kelley and Osborne. Importance of Milk Infection in Transmission of Certain Communicable Diseases of Man. A. J. P. H., 10:66 (Jan.), 1920.

AN HONORARY SCHOLARSHIP FRATERNITY FOR STUDENTS OF PUBLIC HEALTH

During the last academic year the Delta Omega Society, an honorary scholarship fraternity, was founded at the School of Hygiene and Public Health of the Johns Hopkins University. For some time it had been realized that there existed a need for an honorary key society in public health schools similar in scope and object to those organizations existing in colleges and the professional schools. Membership is based upon scholastic attainments, and evidence in proficiency in public health subjects is required. The fraternity received the approval of the faculty and Dr. William H. Welch, director of the school, very kindly assisted materially with advice, and the organization is much indebted to him for valuable suggestions as to the method of organization, formulation of constitution, etc.

The key of the fraternity is a gold disc bearing the letters Delta Omega in pale. The reverse is inscribed with the name of the member, the name of the university and the date. The words "Charter Member" appear upon the keys of those who were first selected for the honor.

Chapters of the organization have been established at the Harvard School of Public Health and the Massachusetts Institute of Technology. The Schools of Public Health of the University of Pennsylvania, Yale University, and the University of Michigan have been invited to apply for charters, and it is believed that these organizations will be effected early in the coming academic year. Other chapters may be established in addition. The secretary is Dr. Milford Edwin Barnes, International Health Board, 61 Broadway, New York City.

The Smallpox Outlook for 1924.—During the first six months of 1924, in 26 states and 7 Canadian provinces, the number of cases of smallpox nearly doubled the number recorded during the same period in 1923. The situation is rendered worse by the fact that this year's smallpox is nearly three times as deadly as the type of the disease which prevailed in 1923. The 7 Canadian provinces show an increase in smallpox cases from 714 in the first six months of 1923 to 1,837 during the corresponding period of 1924. Last year one death was recorded in this area; this year 51 deaths occurred. In the 26 states there were 12,682 cases of smallpox in the first six months of 1923 with 64 deaths, giving 5 deaths per 100 cases, while in 1924 there were 22,682 cases and 314 deaths giving 1.4 deaths per 100 cases. Smallpox became epidemic in Detroit in the latter part of 1923. From January 1 to June 30, 1924, 1,508 cases and 140 deaths occurred. In Pittsburgh, a severe outbreak began about the middle of June, with 55 cases and 11 deaths reported up to July 19th.—*Statistical Bulletin*, Metropolitan Life Insurance Company, (Aug.), 1924.

MENTAL HYGIENE AND THE HEALTH OFFICER

EXTRACT OF THE REPORT OF THE COMMITTEE ON MENTAL HYGIENE*

Read before the Conference of State and Provincial Health Authorities of North America, Lansing, Michigan, June 17, 1924.

IN THE FIELD of mental hygiene the public health officer is faced with a type of problem the nature of which is quite different from those he handles in his usual work. Aside from those mental disorders due to infections, such as syphilis, pellagra, encephalitis lethargica and the like, and those associated with certain bodily states, such as arteriosclerosis, senescence and other physical deteriorations, mental disorders fall either in the group of psychogenic disorders or physical disorders still too obscure for practical management. Furthermore, mental and nervous disorders form a part in a larger whole, the origins of which are similar, and all of which must needs be embraced in the term "mental hygiene."

Mental hygiene problems are not, therefore, confined to problems of disease, and in the field of disease not to physical disease, but in addition to these have to do with problems of delinquency, of social inadequacy, of dependency and the like. The common origin of these problems, where they are not primarily physical or economic—as in most cases it is coming to be believed they are not—lies in the field of personality development, of intellectual equipment, mental habit formation, emotional development, lack of development, or frustration with its consequent unhealthy emotional compensations, and frequently overcompensations, which manifest themselves on the one hand in mental and nervous disorder and on the other in various types of social maladjustment.

In considering, therefore, the future development of organized mental hygiene work in this country looking to the prevention of nervous and mental disorder, of delinquency, social inadequacy and dependency, it is apparent (1) that the public health officer in his epidemiological work contributes directly and importantly to one phase of mental hygiene work; (2) that in his attack upon the incidence of syphilis and his campaigning for the adequate, early treatment of those infected with syphilis, he contributes again in a very direct way to an important aspect of mental hygiene; (3) that in his campaign of education for the maintenance of better physical health generally, he contributes to that part of mental hygiene concerned with the prevention of nervous and mental disorders due to physical deterioration; (4) that the prevention of those disorders, personal and social, which are dependent upon the emotional and intellectual qualities and training of the individual, do not lie clearly in any one professional field, such as that of the public health officer, but must be accomplished through the professional cooperation of various groups, particularly those who have to do with the activities of children.

At the present time the responsibility for the care of the insane is placed in many states upon a central board of administration. These boards, together with the hospitals which they administer, are each year taking more interest in the preventive aspects of their work through the development of out-patient clinics, (1) for the continued treatment of patients on parole; (2) for the examination of patients referred to them in the expectation that early treatment may make unnecessary a period of hospital residence; (3) for the examination and treatment of children who, as a result

* This portion of the report was prepared by Frankwood E. Williams, M.D., Medical Director National Committee for Mental Hygiene, Consulting Member of the Committee. The other members of the Committee were: Eugene R. Kelley, M.D., *Chairman*, W. D. Cogswell, M.D., C. A. Harper, M.D.

of faulty mental habits already formed or in the process of formation, are giving trouble in the school, the home, or the community. In the latter form of clinic, cooperation with homes, schools, courts, particularly juvenile courts, and social agencies is sought. In such states as Massachusetts, New York and Pennsylvania, these out-patient clinics have been extensively developed by the state hospitals, so as to give competent psychiatric service to practically all parts of the state. Such clinics are of inestimable value in any state mental hygiene program.

In addition to those clinics organized and conducted by the personnel of the state hospitals, other clinics of a similar type are being established in various parts of the country which are not associated with state hospitals. In some instances they form a part of a community health center or of a general hospital; in other instances they are organized and maintained by agencies such as juvenile or criminal courts, schools, social agencies for family and child welfare and the like, or groups of these agencies are associated together, as in the child guidance clinics conducted by the National Committee for Mental Hygiene (in Cincinnati, St. Louis, Dallas, Texas, Minneapolis-St. Paul, Los Angeles), which find they have a need for the full-time service of a psychiatric clinic. Clinics are also maintained by state societies for mental hygiene (in Connecticut, Rhode Island, Illinois and Kansas).

It is to be expected that each of these types of clinics will increase. As funds become available more state societies for mental hygiene will organize clinics for the purpose of demonstration, to be maintained by the society until such time as the local state hospitals or state hospital commission can assume their management. Many state hospitals throughout the country, and state commissions on mental disease, which have not yet been able to open out-patient clinics, have plans for doing so, and others which have some clinics are planning to develop others. Courts, juvenile, criminal and domestic, are becoming convinced that without the personal data acquired by competent psychiatric and psychological examinations, they are seriously handicapped in the performance of their duties, and clinics in these courts are being established as rapidly as trained personnel can be found. The social agencies and the schools are likewise becoming eager for this type of service and plans are being made in many places for such work. A considerable number of joint, coöperative clinics will develop to meet the needs of these organizations.

The machinery for mental hygiene work would, therefore, seem to be quite generally distributed throughout the community; in some instances units working independently; in others many units being headed up either by a state hospital, a state commission on mental diseases, or a state society for mental hygiene. So far as we are aware, no city department of health maintains a bureau of mental hygiene, although the city of Newark, New Jersey, for a short time had such a bureau, and only one state department of health, Connecticut, maintains a bureau of mental hygiene. The Bureau of the Connecticut department of health has not been particularly active, however, and its program, so far as announced, would indicate that its functions are conceived as those usually assigned in larger states to a state commission on mental diseases.

Public health officers have not, except as mentioned above, taken a very active part in mental hygiene programs. Their time has been fully occupied with other aspects of public health work; their community contacts do not tend to lead them where problems of mental hygiene are; their training has been designed for other purposes and does not particularly prepare them either to identify or to deal with mental hygiene problems. It is recognized that for the successful handling of these problems as particularized and special a training is required as

is necessary for the public health officer in the field which he now occupies.

It need scarcely be said, we are sure, that the public health officer should give his support and coöperation to local mental hygiene work that may be under way in his state or community. The further question, however, as to whether the public health officer should enter more actively into mental hygiene work, or should endeavor to incorporate mental hygiene work into his present work, would seem to warrant further serious consideration. Circumstances will tend somewhat to formulate an answer. Where there is another department of the state better equipped for mental hygiene work by reason of greater familiarity with the problems, of trained personnel and greater facilities, it would seem wise that this department assume responsibility for such work, the public health officer supporting and coöperating. Where such a department, with personnel and facilities and knowledge of the problems, is unable for one reason or another, or is not disposed to undertake such work (in other words, a department that is equipped, but backward), such department should be encouraged and spurred to assume this responsibility. In a community where mental hygiene work has not been undertaken, or plans do not exist for such work, where properly trained personnel exists or can be obtained, the development of a program of mental hygiene by the public health officer may be desirable.

The only object there can be, of course, in assuming the responsibility for any type of program, is that an important public service may be rendered. Only a disservice is rendered, however, if a program is undertaken under circumstances which in advance prejudice its success. Granting the importance of a mental hygiene program, the public health officer has, therefore, to consider whether he is or others are best fitted for the undertaking. The question should be faced frankly whether a bureau of mental hygiene in a department of health, for example, would likely thrive well as a part of the larger whole, where the methods employed and the thought and philosophy are likely to be quite alien. The methods, thought and philosophy that develop about pieces of work are those that grow out of the nature of the work. One differs from another as the nature of the work differs. Both are right and serve their respective purposes. Whether they can be successfully combined, however, is a practical question of first importance.

It would seem that rather than to attempt at the present time to formulate the specific responsibilities that the public health officers might be expected to assume in the field of mental hygiene, it would be wiser to keep the question an open one for further consideration.

(In closing its report the Committee again reiterated its belief that mental hygiene is a matter which deserves the serious, consistent and close attention of departments of public health throughout the country, and as a first step in this direction the Committee recommended the adoption of a minimum program by each state to the end that those causes and conditions that tend to undermine mental health may be discovered, and such steps taken as to reduce to a minimum the numbers of persons now suffering from various forms of preventable mental diseases.)

THIRD ENGLISH-SPEAKING CONFERENCE ON INFANT WELFARE

London, July 1–3, 1924.

Dr. Julius Levy, who represented the Association at this Conference, prepared the following summary of the most important papers delivered:

"The Available Measures for Securing Healthy Pregnancy and Safe Delivery," Lady Barrett, C.B.E., M.D., M.S., Consulting Obstetric and Gynaecological Surgeon, Royal Free Hospital.

In this paper it was brought out that although the direct cause of maternal mortality and morbidity may be sepsis, hemorrhage, toxaemias, difficult labor and complications, the conditions which sap the general health of the pregnant mother are far reaching.

An earnest plea was made for: (1) Better antenatal care. (2) For efficient midwife to recognize where her limits end and where those of the doctor begin. (3) For hospital beds for complicated maternity cases. (4) For suitable meals and the teaching of cooking for the pregnant mothers at maternity centers. (5) For permission to allow the pregnant mother to continue to do light factory work rather than heavy housework.

"Available Measures for Securing Healthy Pregnancy and Safe Delivery in the United States," Carolyn Conant Van-Blarcom, New York.

In this paper it was stated that the high percentage of maternal mortality in the United States was due to the lack of skilled care on account of relatively few obstetricians; too few hospitals providing good maternity service training; the large number of untrained, uncontrolled midwives.

Descriptions were given of: Routine at Johns Hopkins Hospital, Baltimore. Maternity Centre Association, New York City. Sheppard-Towner Act of 1921—(1) Appropriation $1,240,000 annually. (2) Forty states working under this act.

"The Available Measures for Securing Healthy Pregnancy and Safe Delivery in Canada," Dr. Helen MacMurchy, Chief Division of Child Welfare, Department of Health, Canada.

In this paper it was brought out that to make the world safe for mother and baby there must be—(1) Medical care, (2) Nursing care, (3) Domestic care, (4) Community care. According to this paper these phases of public health work are carried out in certain provinces of Canada.

The Union Hospital Scheme consists of twelve hospitals for maternity cases where two or more rural municipalities have joined in building and maintaining. In 1923, 328 mothers were helped through the expenses of confinement by the maternity grant of $25.00 each. There seems to be quite extensive public health nursing service throughout Canada, but they do not recognize the midwife.

"Psychological Aspects of Propaganda," Geo. H. Green, Esq., B.Sc., B.Litt., Lecturer, University of Wales.

A few good ideas are brought out: That propaganda means action, that the psychologist is as interested in the successful sale of a gold brick as in boosting an imperial exhibition.

"Child-birth in India," R. J. Blackham, C.B., C.M.G., C.I.E., D.S.O., M.D., M.R.C.P.E., D.P.H., Late Hon. Surgeon to Viceroy of India.

Dr. Blackham tells of the horrible conditions which have always attended childbirth in India. The dai or midwife is of the lowest calling and her work is considered unclean and filthy. Many mothers are made childless and permanently disabled through maltreatment at delivery. Through racial prejudice and superstition little has been done, and much remains to be done for the mothers and babies of this land.

"The Training of Midwives," Ethel Cassie, M.D., D.P.H., Chief Medical Officer for Child Welfare, City of Birmingham.

It would seem that the midwives are most inadequately trained. Their training is obtained from various sources, *i.e.*, a few good schools, poor law institutions and from other midwives already in practice. They receive practically no antenatal instruction; make frequent internal examinations; know nothing about ophthalmia neonatorum or the use of silver nitrate, and what little instruction they receive after training is given on the occasional visit of the Inspector of Midwives. Added to this they are too busy to do their patients

justice. The remedies called for are: better training, instruction from doctors at clinics, better remuneration for their cases, which would allow fewer cases necessary to make a living, and on the whole more concentrated supervision. (This is certainly surprising to us in New Jersey when we consider that every midwife, whether licensed or unlicensed, is known personally by our supervisors.)

"The Prevention of Foundlings," Julius Levy, M.D.

Dr. Levy pointed out that the problem of the foundling and of the illegitimate child is one and the same, for it is the illegitimate child who usually becomes the foundling. There are from 50,000 to 70,000 illegitimate children born in the United States each year. His paper described New Jersey's attempt to plan for the future of the unmarried mother and her baby, that they may be kept together. During four years the status of 80 per cent of 450 girls is known. Ninety per cent of the babes remained with mothers at least three months; 73 per cent remained six months. In 1923, 75 per cent of the mothers returned to their homes with their infants.

In the city of Newark the infant mortality rate for illegitimate infants was about 79.7, about the same as the rate for the cities and about one-third of the rate reported by most states and countries for illegitimate infants.

The plan of saving the baby has proved to be the very best way of saving the mother and the work conducted by the Child Hygiene Division of the Department of Health better than that of a religious or social agency.

"Child Adoption," Gerald B. Hurst, K.C.

Mr. Hurst says that the law of England does not permit a transfer of the mothers' rights and liabilities. Public opinion has thus far out-based legislation, for adoption in England is a common practice and the need to regularize its procedure and to secure it against possible abuses is more and more recognized by social workers. Several bills to meet this need had been introduced in Parliament.

"Training of the Health Worker," Janet E. Lane-Claypon, M.D.

Dr. Janet Lane-Claypon pointed out the distinction between the mental attitude required for prevention and for curative work, and stated that unless there are sufficient workers to carry out all the work required the appeal of the curative work is liable to press out the preventive work which at the moment would appear to be less urgent. There should be three divisions of workers, the midwife, the health worker and the curative worker. The health worker should have some experience of sickness, but need not have a full hospital training. She should have a knowledge of midwifery and be trained in sanitation in its widest sense. There should be a profession of health worker, as it is not possible for the average person adequately to combine the duties of health worker with those of any other profession.

"Maternal Mortality," J. Theodore Dodd, M.A.

Mr. Dodd discussed infant and maternal mortality rates in relation to out-relief for the poor. He recommended plenty of out-relief during pregnancy and after, as a cure for high mortality rates and quoted facts showing the contrast of high mortality rates where there was little or no out-relief given, and where there was considerable out-relief that the infant and maternal rates were comparatively lower.

"Child Adoption," Mrs. David Margesson.

Mrs. Margesson suggests that the illegitimate child is better off when adopted into a family where it inherits the family name and love, than when kept with the mother or foster-mother; that an adoption successfully carried out is in most cases an advantage to the mother, always of advantage to the child, and of the highest value to the community as a whole.

"The Adoption of Children," Henry Dwight Chapin, M.A., M.D.

Dr. Chapin stated that there is nothing new in the regulation of the adoption of children, that the Babylonians had laws for its operation 2285 B.C., also early Syrians, Greeks, Egyptians and Romans. At the present day nearly all the nations of the world have laws concerning adoption. England is one of the few civilized countries that has no adoption laws and never has had any, while adoption is now general in the United States. Dr. Chapin pointed out that maternity becomes increasingly difficult as we go up the social scale, and that it would be most beneficial if the surplus children at one end could be transferred to the other end. He believes that conditions usually attributed to heredity are due to environment in the early months and

years. He stated that 3 to 12 per cent of all births in civilized countries are illegitimate, and that they present a higher death rate because of the lack of proper care. Though most agencies and institutions recommend keeping mother and baby together, he believes that the child of an unmarried mother is better off if adopted into a good family. Dr. Chapin spoke of the advanced stand with regard to children born out of wedlock in Norway, where efforts are made by the state to establish the paternity of the child, and 40 per cent of these children receive support from their fathers.

"Oversea Settlement of Children from the Barnardo Point of View," Mr. Percy Roberts.

Well planned and wisely conducted child emigration, especially in Canada, contains the solution of some of the mother country's most perplexing problems. In England the children are boarded out as early as three and four years of age; in Canada the age is between ten and eleven.

The British public through the Barnardo Organization has spent over one million pounds sterling in Canada in the settlement of 28,000 boys and girls, great stress being laid on the importance of after-care. Three years ago operations in the same line were started in Australia. Four hundred and sixty boys and girls have been received in that great island in a wonderful spirit of kindliness. The generous spirit of welcome with which these children are received quickens them into new life. They enter the homes of a fine type, Canadian and Australian farmers, as members of the families, and the new environment works wonders in a few months.

"The Training of Nursery School Workers," Miss E. Stevenson.

The nursery school must become not only a place of nurture for little children, but a place of training for many young people who will be called on to help in this work. It is found that a nursery school can accommodate two hundred to three hundred children. The larger nursery schools must be open air. There must be at the head a superintendent who is to train the young teachers and the students. The young teacher will have to learn from her how to deal with questions related to the work of a clinic, social work relating to condition of homes and the application of the theory of education to the new conditions under which she is now working.

The heads of shelters are applicants having the Froebel High Certificate and the Board of Education Certificate, always supplemented by training given by the existing nursery school centers. The students who work in the shelters are bona fide students apprenticed to their own great professions, they study the child from his earliest years and watch his development. This course should not be less than three years and the theoretical work should be carried on side by side with the practical.

"The Diet of Children on Ocean Steamers," Dr. Mildred Thyme.

All shipping companies carry children under twelve months free of charge and many do not charge for children under three years. A few lines carry fresh milk for a certain period of time. All lines carry brands of canned milk and dry milk for children under one year. Children from one to five years receive a general light diet, one-half the ration of the adult. Food is supplied according to parents' wishes on many liners; one or more stewardesses are trained nurses. None carry nurses with a special training in children.

EDITORIAL SECTION

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THE COST OF MINOR AILMENTS

The cost of diseases generally considered trivial is not generally recognized, and too iittle attention is paid to those diseases which do not leave evident or permanent disability on one hand or cause death on the other.

A recent study[1] of absences in certain public schools in Washington, D. C., has brought this matter to the front. The conclusions arrived at were: (1) That over 70 per cent of absences were due to medical causes; (2) That more than 25 per cent of all absences were due to common colds, while approximately 40 per cent were due to disorders of the respiratory tract.

Thus it seems that the so-called trivial diseases are the chief single cause of absence from school, with the attendant loss of time and cost to the community. In a group of 223 boys and 222 girls, there were 1418½ days of absence due to ordinary colds. Another aspect of the case, of which we cannot speak dogmatically, is the more or less permanent and injurious effect which common ailments have on more serious trouble. We have not even begun to measure this, but there can be little doubt that the ordinary cold taxes our resistance and should be avoided whenever possible.

We have in the past conceded the prevalence of many so-called children's diseases and the ordinary trivial ailments, largely because it was not known how to prevent them, and because in some cases the prevention seemed to entail a greater cost than it was worth. Relative values in public health work must never be forgotten, but with our advance in knowledge, it naturally comes that we must in the future pay more attention to the prevention of trivial ailments.

1. Public Health Reports, September 12, 1924.

THE SMALLPOX SITUATION

There have recently appeared in several health department periodicals statements disclosing interesting sidelights on the smallpox situation and drawing the reader's attention to the comparative prevalence of this disease in certain states, most especially Massachusetts, Michigan and California.

Smallpox will doubtless be in general prevalence throughout the United States and Canada during this winter. Conditions are ideal for the rapid dissemination of this disease in many cities where the health departments are idle, falsely believing themselves secure from the ravages of this plague. Detroit's smallpox history in its last crisis will show the underlying reasons for the program now in effect—the history will prove the necessity for more drastic measures than mere warnings.

The weekly incidence of smallpox slightly exceeded the norm (average for several years increased for population growth) in Detroit in October of last year. The health department sounded its usual warning. There were two-column articles in the press. The theatres carried moving pictures of the Health Commissioner and his staff being vaccinated. Health bulletins carried special messages urging vaccination—with the result that a mere forty thousand responded.

Smallpox, like other communicable diseases, spreads by contact between human beings, and in this day of close contacts, is conveyed with the speed of the express train. The community which today is clean and pure may tomorrow be dirty and infected.

There are certain large industrial cities in the north which shine out as a beacon of hope and life to those seeking employment—particularly to those harassed by the boll weevil farther to the south. These wanderers are, for the most part, unvaccinated. They are ready suscepts for infection, as shown statistically in our army experience, and they carry with them seeds of disease.

Smallpox, therefore, gradually spread through Detroit, though confined for many months to the newcomers whose disease was of a mild type. Suddenly, however, there appeared from the far northwest, an individual infected with hemorrhagic smallpox who spent only ten days in Detroit, and then departed for territory unknown. But he left in his wake one thousand persons with smallpox, of whom one hundred and fifty died.

It is interesting to note these facts in connection with the Detroit outbreak. The Health Department was not and had not been asleep. Two hundred thousand Detroiters had been vaccinated just before the appearance of the stranger. The school children had been immunized, and these children escaped the disease entirely, the school routine being in no way modified. Those who suffered and who died in numbers did not believe in vaccination, or else were too ignorant to give it a second thought.

Detroit saw its problems! It was to force vaccination on those two classes of persons—those who did not believe in it, and those who in ignorance and carelessness neglected it. Public opinion, formed and made militant by an awakened and coöperative press, brought many non-believers to immunization. Police power took care of the rest. Large city areas were marked off and placed under quarantine, and every individual in these areas was vaccinated regardless of previous histories. Contacts were followed thoroughly and quarantine established and vaccination forced in all cases. One million persons were vaccinated in Detroit during the winter and spring months through the acommodation of these two forces. Smallpox disappeared!

Smallpox did not occur among those showing successful vaccination of less than seven years standing, but the fact that ten per cent of Detroit's cases were among those whose vaccinations were very old proved that vaccination, once in a lifetime, was not sufficient. Ninety per cent of Detroit's cases were among those who had never been vaccinated.

A program based on Detroit's situation or experience should include working through industries. Make vaccination a requirement for employment—lay emphasis on forms of employment. Watch food handlers especially—they are apt to be floaters. Food handling establishments in Detroit will not employ unvaccinated individuals. Follow up all cases of smallpox, establishing quarantine and requiring vaccination for even remote contacts. Make periodic investigation of cheap boarding houses; vaccinate all floaters particularly. Keep a check on municipal employes, especially those in close contact with the public.

Let us remember above all things that recourse to literature, lectures, and general appeal is not enough. Do not be satisfied because school children are vaccinated. There must be revaccinations, and especially must you reach those who oppose vaccination most and whose obstinancy and ignorance (or both) form a menace to the common health.

ANTITYPHOID VACCINATION BY THE MOUTH

During the past year, there have been several reports of the administration of vaccine by the mouth for the prevention of bacillary dysentery. Recently the same author has reported to the Academy of Medicine of Paris on the use of antityphoid vaccine by the mouth with results which are surprisingly good.[1] Of 1,210 persons who received the vaccine between May and December, 1923, in Athens and Salonica, not one developed typhoid fever, although the disease was endemic in these districts. To give a stronger proof, three Greek villages in an area in which there was a considerable amount of epidemic typhoid were chosen, and general vaccination of the inhabitants by the mouth was undertaken. A dose of 1 c.c. for adults, ½ c.c. for children of two to six years, and ¼ c.c. for children below two years, was given daily and repeated for three consecutive days, the vaccine being administered in water on an empty stomach. In one village in Attica a severe epidemic was brought to a rapid and complete end, only one case of typhoid having occurred after taking the treatment. This one case developed seven days after the administration of the vaccine, consequently before immunity could have developed. The source of contagion continued to exist, as no measures were taken to purify the water supply. In two other villages situated in Eubœa, four cases of typhoid were seen after the administration of the vaccine, all occurring in the first few days during what is called the negative phase.

The author of the paper is conservative and does not feel that these favorable results prove the case, but thinks that further trial of the method should be carried on.

In the discussion of this paper, the favorable results obtained by Vaillant in the epidemic at Pas de Calais in 1921, in which the oral method was followed, were cited. On the other hand, the case of a nurse was reported who took twenty-eight doses of vaccine in the course of a week, yet developed a severe case of typhoid three and a half months later.

If the value of oral administration can be demonstrated, it will be a distinct advantage over the hypodermic method, which is dreaded by many people, in spite of the trivial pain caused. As typhoid fever is contracted through the digestive tract, there seems to be good reason to believe that vaccine may be administered in the same way. We have heard so much, however, of the administration of vaccine against smallpox by the mouth, and other absurdities of a similar character, that one is naturally cautious about adopting this new method. It should have the backing of impartial observation carried out on a large scale before general acceptance can be recommended.

1. *Bulletin de l'Académie de Médecine*, XLI, 1924.

ETHYL GASOLINE AND LEAD POISONING

New uses for many substances, in this instance lead, are continually being discovered. Lead is now apparently about to enjoy a very extensive application in the matter of motor fuels where it is to be added to gasoline for the purpose of increasing the efficiency of the engine. This of course at once raises the health question of lead poisoning.

Midgley and Boyd[1] have published the essentials of the new use for lead. These investigators point out that the automobile represents the first great advance in individual transportation since man began to use the horse. This transportation is obviously dependent upon an adequate supply of liquid fuel which for a number of obvious reasons means *petroleum*. In 1921 the production of gasoline in the United States was over five billion gallons, or the equivalent of filling a standard tank car every minute of the year. The fear is that the supply of this fuel may not keep up with the demand for it. Our supply of petroleum is being rapidly depleted. While other fuels, as from shale, coal and alcohol, may offer a reserve for the future, it will be many years before sufficient material can be obtained from these sources to supply any considerable percentage of the motor fuel requirements of the country. These workers therefore investigated the problem of increasing the efficiency with which the energy of gasoline is utilized and therefore of obtaining "more miles per gallon." To do this and still maintain acceleration and hill-climbing ability, it has been found necessary to discover a substance which will permit increased pressure of explosion while using gasoline. Here the chief difficulty has been the "knock." It is well known that if substantial percentages (40-60%) of benzene or alcohol are mixed with gasoline, fairly high compression can be obtained without the objectionable "knock" with its attendant loss of power.

The authors claim to have found that the "knock" in internal combustion engines is a chemical rather than a mechanical phenomenon; hence their investigation of various "anti-knock" chemicals. These include such substances as iodine, nitrogen, silenium, tellurium, tin and lead, all of which retard the knock.

Lead tetraethyl appears to surpass all the others. As an "anti-knock" compound when compared with benzene in 25 per cent concentration in kerosene, 1 volume of it is said to be equivalent to about 625 volumes of benzene. These "anti-knock" materials have been quite widely used in airplane engines, and their great effectiveness demonstrated.

1. Chemical Control of Gaseous Detonation, etc., and The Application of Chemistry to the Conservation of Motor Fuels. *Jr. Ind. & Eng. Chem.*, Vol. 14, No. 9, p. 849 (Sept., 1922); and No. 10 (Oct., 1922).

Benzene exerts its influence as a fuel; therefore requiring large quantities for admixture, whereas, the substances named are effective in fractions of a per cent. Lead tetraethyl is a compound in which a molecule of Pb is combined with four molecules of C_2H_5. The preparation has been put upon the market under the name of "Ethyl Gas" by the General Motors Chemical Company or, more recently, the Ethyl Gasoline Corporation.

Midgley and Boyd feel that it will be only a matter of time when all gasoline will be treated with an "anti-knock" material and that automobile engines having higher compression and giving considerably greater mileage per gallon will be used.

Foreseeing the possibility of health hazard to garage and motor workers, as well as to users and the general public, the Corporation arranged with the United States Bureau of Mines in the autumn of 1923 to begin at its Experiment Station in Pittsburgh, a series of extensive investigations on the pharmacology and toxic effects, if any, of *ethyl gasoline* when used as a motor fuel, and particularly as to the resulting exhaust fumes from motors. Reports on this work are expected within a few weeks, in which the results of animal experimentations, human exposures, the analysis of air, of street drippings, etc., are to be covered. While it is probable that the full safety of the public and others will be demonstrated as the result of these investigations, this method of procedure also illustrates a somewhat new idea in connection with the exploiting of new discoveries to the public, viz., the primary investigation of the public health aspect. As we know, there are now many substances and appliances upon the market which are dangerous to users as well as to the public which unfortunately have not been given this preliminary study.

MEASURING PERSONAL COMFORT WITH THE KATA THERMOMETER

Personal comfort depends largely upon the rate of cooling of the human body. In other words, the temperature, humidity, and velocity of the surrounding air should be within reasonable limits to permit the heat generated within the body to be removed at the same rate. Persons working under uncomfortable conditions are necessarily inefficient, although through no fault of their own. Modern industry, to produce the best results from workers, now realizes the importance of personal comfort and is installing equipment to control these three factors pertaining to human comfort.

It has been shown lately that there is no single index of comfort in atmospheric conditions. The mercury thermometer, which until recently was the only instrument used for measuring the physiological effects of atmosphere, is very inadequate for the purpose, as it merely accounts for that part of the body heat lost by radiation and convection, while a great part of the body heat resulting from the metabolic processes within the body is eliminated by means of evaporation from the surface of the body. This lack of a suitable measuring instrument was partly overcome in 1916, when Dr. Leonard Hill, of England, who introduced the kata-thermometer, brought out an improved type. This instrument measures its own rate of cooling when its temperature approximates that of the human body, and thus, under favorable conditions of the environment, serves as an index of the rate of cooling of the body itself.

The kata-thermometer is a specially constructed alcohol thermometer having a stem 20 cm. long, and a cylindrical bulb 1.8 cm. in diameter and 2.2 cm. in

length. As the top and bottom of the bulb are hemispherical, its total length is 4 cm. The stem is graduated in 0.1° F. from 95 to 100°, and an enlargement of the bore at the top of the stem serves as a safety reservoir in case of accidental over-heating.

In manipulating the kata-thermometer, the bulb is heated in water until the alcohol rises to the reservoir mentioned, dried, and the time taken for the alcohol to fall from 100 to 95° is measured by a stop-watch. This time is a function of the heat loss from the surface of the kata-thermometer by radiation and convection. While the heat lost is always the same, the rate of loss depends upon the surrounding atmospheric conditions. It is evident therefore, that there exists a definite relation between the time of cooling of the kata-thermometer and the external conditions.

The preceding procedure is known as "dry kata" cooling, but if a wet cotton glove be fitted over the bulb, the rate of cooling due to radiation, convection, and evaporation is obtained, and is known as "wet kata" cooling. The rate of cooling due to evaporation is approximately the difference between these two rates. Dry-kata cooling is considered more representative of comfort under conditions not inducing perspiration, and wet-kata cooling under conditions inducing perspiration. Several readings should be made in all observations, whether dry or wet.

All kata instruments are calibrated by the maker and their factor is engraved on the stem prefixed by the letter F. This factor divided by the time of cooling gives the cooling power of the atmosphere in millicalories per sq. cm. per sec. According to Hill, comfortable conditions correspond to a dry-kata cooling power of 6 millicalories per sq. cm. per sec. and a wet-kata cooling power of 18 millicalories per sq. cm. per sec.

The kata-thermometer under ordinary conditions may also be used as an anemometer. The instrument has its defects, and it is very doubtful whether any single instrument can be designed to serve as an index of human comfort.

Apart from the studies made in England and Transvaal, in America a great deal of work has been accomplished along this line by the United States Bureau of Mines jointly with the American Society of Heating and Ventilating Engineers.

LIST OF MEMBERS

Proposed for election to the A.P.H.A., August 30 to September 30, inclusive

Names of New Members are set in Light Face Type.

Names of Sponsors are set in **Bold Face** Type.

ALABAMA

Homer N. Calver, New York, N. Y.
T. E. Tucker, M.D., B.S., Dothan, Alabama. City and County Health Officer.

CALIFORNIA

Arthur S. Baker, M.D., Alhambra, Calif.
Ottilie K. Stocke, R.N., Health Office, Alhambra, Calif. Director of Laboratory.

Elisabeth MacVeen Saphro, M.D., Los Angeles, Calif.
Adele Brown, M.D., Los Angeles, Calif. Deputy County Health Officer, Child Welfare Division.

CONNECTICUT

Leonard Greenburg, M.D., New Haven, Conn.
Robert Jordan, B.S., C.P.H., New Haven, Conn. Instructor in Public Health, Dept. of P. H., Yale University.

FLORIDA

Earle D. Clawson, D.V.M., West Palm Beach, Fla.
Mary C. Ryan, West Palm Beach, Fla. City Bacteriologist.

ILLINOIS

Hugh O. Jones, M.D., Chicago, Ill.
Charles K. Stulik, M.D., Chicago, Ill. Supervisor Infant Welfare, Board of Health.

IOWA.

R. L. Laybourn, Iowa City, Iowa.
John A. C. Busby, M.D., Iowa City, Iowa. Asst. State Epidemiologist.

MARYLAND

J. H. Shrader, Ph.D., Baltimore, Md.
Joseph C. Swenarton, D.Sc., Baltimore, Md. Asst. Director, Bureau of Bacteriology, Health Dept., Baltimore.

MASSACHUSETTS

Homer N. Calver, New York, N. Y.
Philip V. Erard, Springfield, Mass. Chairman, Board of Health.
Richard A. Rochford, M.D., A.B., Springfield, Mass. Member of the Board of Health.
Jacob R. Sackett, Springfield, Mass. Agent, Board of Health.

Willard E. Ward, Brookline, Mass.
Florin J. Amrhein, Boston, Mass. Professor of Chemistry, Mass. College of Pharmacy.

MEXICO

A. Brioso Vasconcelos, M.D., Mexico City, Mexico.
Salvador Bermudez, M.D., C.P.H., Mexico City, Mexico. Medical Inspector in T. B. Campaign, Board of Health.
Jose Gomez Esparza, M.D., San Jacinto, Mexico. Director of Zootechnics.

MICHIGAN

Homer N. Calver, New York, N. Y.
Nathan Sinai, M.S., Ann Arbor, Mich. Instructor, Public Health and Hygiene, University of Michigan.
William N. Braley, A.B., M.D., Highland Park, Michigan. Health Officer.

W. J. V. Deacon, M.D., Lansing, Mich.
Josephine Morrisey, Lansing, Mich. Chief Clerk, Div. of Epidemiology, State Dept. of Health.

H. T. G. Naumann, Port Huron, Mich.
Gertrude A. Sullivan, M.D., Port Huron, Mich. Health Officer.

MISSOURI

John F. Norton, Ph.D., Columbia, Mo.
Hugh Allen Wyckoff, B.S., Cameron, Mo. City Bacteriologist, Professor Bact. and Hygiene, Mo. Wesleyan College.

Homer N. Calver, New York, N. Y.
Arthur I. Kendall, St. Louis, Mo. Professor of Bacteriology and Public Health, Wash. Univ.

NEW MEXICO

G. S. Luckett, M.D., Santa Fe, New Mexico
D. C. Daniel, M.D., Mosquero, N. Mexico. County Health Officer.
Harry P. Mera, M.D., Santa Fe, N. Mexico, County Health Officer.
Zalmon Edgar Funk, M.D., Santa Rosa, New Mexico. Part Time Health Officer.

NEW YORK

L. D. Bristol, M.D., Olean, N. Y.
Stephen A. Douglass, M.D., Olean, N. Y. Clinician and Consultant to the Milbank Health Demonstration, Olean.
Clarence A. Greenleaf, M.D., Olean, N. Y. Director School Health Service.

Ada G. Bailey, Saratoga Springs, N. Y.
Ethel Fisher, Saratoga Springs, N. Y. Assistant Bacteriologist, Saratoga County Laboratory.

Homer N. Calver, New York, N. Y.
William N. Campaigne, M.D., Troy, N. Y. Health Officer.

OHIO

John E. Monger, M.D., Columbus, Ohio.
R. H. Markwith, M.D., Akron, Ohio. Health Commissioner.

Homer N. Calver, New York, N. Y.
Donald C. Mebane, M.D., Toledo, Ohio. Infant Welfare and Pre-School Clinics.

OKLAHOMA

Homer N. Calver, New York, N. Y.
David Thomas Bowden, A.B., M.D., Oklahoma City, Okla. Asst. State Commissioner of Health, and Director of Rural Sanitation.

PENNSYLVANIA

Homer N. Calver, New York, N. Y.
Howard F. Bronson, C.E., Harrisburg, Pa. Chief, Div. of Housing, Engineering Bureau.
Hannah McK. Lyons, M.D., Philadelphia, Pa. Nutrition and Health Teaching for the Phila. Interstate Dairy Council.
C. W. Schmehl, M.D., Warren, Pa. County Medical Director, Penna. Dept. of Health

RHODE ISLAND

Homer N. Calver, New York, N. Y.
Francis W. Constable, Providence, R. I. Bacteriologist, St. Joseph's Hosp.

SOUTH CAROLINA

Harry B. Neagle, M.D., Augusta, Ga.
L. W. Martin, M.D., Walterboro, S. C. Health Officer.

TENNESSEE

Homer N. Calver, New York, N. Y.
Mrs. Lewyn M. Neblett, Memphis, Tenn. Executive Secretary of the Shelby Co. Tuberculosis Society.

TEXAS

Homer N. Calver, New York, N. Y.
John Wm. Brown, M.D., C.P.H., El Paso, Texas. City Health Officer.
Paul S. Fox, B.S., M.S., Santa Fe, New Mexico. Sanitary Engr., Bureau of Public Health, Santa Fe.
Martha T. Juve, P.H.N., Denton, Texas. Red Cross County Public Health Nurse.

A. H. Flickwir, M.D., Houston, Texas.
T. O. Woolley, M.D., Houston, Texas. Supervisor of Hygienics, Houston Public Schools.

WEST VIRGINIA

John Thames, M.D., Kingwood, W. Va.
M. Ella Binsley, R.N., Kingwood, W. Va. Public Health Nurse with Preston Co. Health Unit.
Georgia Harrison, R.N., and P.H.N., Kingwood, W. Va. Public Health Nurse with Preston Co. Health Unit, Maternity-Infant Hygiene.

WISCONSIN

G. Windesheim, M.D., Kenosha, Wis.
Marie A. Thurn, Kenosha, Wis. Registrar of Vital Statistics.

W. D. Stovall, M.D., Madison, Wis.
E. V. Brumbaugh, M.D., M.A., Madison, Wis. Health Officer.

C. M. Baker, Madison, Wis.
Charles I. Corp, B.S., M.S., M.E., Madison, Wis. Professor Hydraulic and Sanitary Enginr., Univ. of Wis.

J. F. Lampson, M.D., Milwaukee, Wis.
Merle R. French, M.D., Wilwaukee, Wis. Director, Bureau of Communicable Diseases, Milwaukee Health Dept.

ASSOCIATE MEMBERS

CANADA

Homer N. Calver, New York, N. Y.
George Hilton, V.S., Ottawa, Ont., Canada. Administrative Federal Meat Inspection Service.
Clara B. Albert, R.N., Kitchener, Ont., Canada.

NEW YORK

Homer N. Calver, New York, N. Y.
Nicholas Blaauboer, Albany, N. Y. Printer of Public Health Magazines.

OHIO

Alfred Asgis, Sc.B., D.D.S., New York, N. Y.
Elmer E. Chambers, D.D.S., Warren, Ohio.

ASSOCIATION NEWS

THE DETROIT ANNUAL MEETING

The Detroit meeting will go down in the annals of the Association as one of the best which the Association has ever held, both scientifically and socially. The total attendance was approximately 900.

It was a great pleasure to have so many Canadian members present, though we particularly missed Dr. Peter H. Brice, who became a member of the Association at its last meeting in Detroit in 1833. It was also a matter of regret that none of the members from our sister republics of Mexico and Cuba were with us. The Association is still American, and we look forward to the time when these sister nations will have a large representation at the meetings.

It is perhaps not too much to say that the Dick test for the diagnosis of susceptibility in scarlet fever and the immunization of susceptible persons by means of streptococcus toxin was the outstanding feature from the scientific standpoint. The demonstrations given of the method were not only observed by our members, but many of them had the test performed on themselves.

All of the section meetings were well attended, and many times there was only standing room. It would be invidious to single out any one section meeting as better than any other, since they were all consistent parts of a well-designed program. The Section on Food and Drugs, in which were considered food poisoning and the most important subject of vitamines and their destruction by canning, and the Section on Child Hygiene drew a large attendance at their sessions.

The conference on the education of sanitarians was most enlightening. It served particularly to indicate to the various specialists the problems of their brother specialists in the public health field, and went a long way toward uniting the special interests represented in the Association.

The only drawback to the entire meeting was the absence of the President, Dr. William H. Park, who, although convalescent from a serious illness, was detained in New York upon the orders of his physician. His illness had prevented the preparation of his address, and since his publications are always illuminating and useful, this constitutes a distinct loss to those in attendance, which we trust may be compensated for to some extent by its publication in the JOURNAL in the near future.

We were fortunate in having present Dr. Th. Madsen, Director of the State Serum Institute of Denmark, recently appointed Chairman of the Health Section of the League of Nations, who was elected an Honorary Fellow of the Association.

The perfect weather allowed the carrying out of the program of excursions and entertainments without discomfort or inconvenience.

The Book Exhibit was unusually successful. There was never a time during the day or evening when readers were not sitting examining the excellent display of books, the sale of which has become a prominent feature of the Association service throughout the year.

Not directly connected with our Association, was a meeting called by Dr. Victor C. Vaughan for the purpose of considering the establishment of a medal in honor of Professor William T. Sedgwick, a former President of the Association. The establishment of this medal was decided upon, and a committee appointed to develop the project and to request the Association to bestow the medal and act as trustee of the memorial fund which will be collected.

ST. LOUIS IN 1925

The officers elected for the following year were:

President, Henry F. Vaughan, D.P.H.

First Vice-President, Oscar Dowling, M.D.

Second Vice-President, Daniel F. McClenahan, M.D.

Third Vice-President, Powhatan S. Schenck, M.D.

Treasurer, Louis I. Dublin, Ph.D.

Executive Secretary, Homer N. Calver.

The Association admitted to affiliation the Virginia Public Health Association and the Massachusetts Association of Boards of Health. This new relationship with the latter organization is a particularly happy one in view of the close association of the two organizations in years gone by.

Detroit was a splendid host and St. Louis has promised to equal its record. Make your plans now to attend in 1925.

DR. LEVY RESIGNS

It will come as a matter of surprise and regret to many members of the Association to learn of the retirement of Dr. Levy from public health work in Richmond, Virginia. The following is an abstract of an editorial which appeared in the Richmond *News Leader* on September 30, 1924:

From the service of the city of Richmond there retires to-day the man who has done more for the health of Richmond people than any man who ever lived and labored here.

Ernest C. Levy became director of the laboratory of the water works in 1904. In December 13, 1905, he qualified as city bacteriologist, and in July, 1906, he became Richmond's first full-time health officer. He held that post until March 26, 1917, when he resigned in protest against the refusal of council to make what he considered indispensable appropriations for the enlargement of the city's activities in the prevention of disease. Serving during the war in the Medical Corps, he returned to Richmond as Director of Public Welfare in 1919.

Except for this one gap of some twenty months, Dr. Levy has been continuously in the service of Richmond for a score of years. During that time he has risen to preëminence in his profession, has received the highest honor in it, that of the presidency of the American Public Health Association, and has made the Richmond Health Department the most famous, as well as the most efficient, possessed by any municipality of approximately the same size in the United States. In methods and in results, the Richmond Health Department has been among the pioneers throughout Dr. Levy's administration. No other activity of the Richmond government, in the whole history of the city, has received such widespread recognition.

For the thirty-five years prior to 1907, the first year of Dr. Levy's administration, the resident death rate of Richmond was 24.8. In 1881 the death rate had been as high as 39.6. Steadily since 1907, the rate has declined until now it is just above 14. During the influenza epidemic of 1918, the death rate in Richmond was not so high as the average death rate before Dr. Levy began his work.

From 1870 through 1895 the annual mortality from diphtheria was 51.2 per 100,000. Then came Behring's diphtheria antitoxin. In the eleven years following its introduction the average death rate was 19.1. After 1906, when Dr. Levy made the use of antitoxin almost compulsory in diphtheria and put it at the disposal of all the people, the rate dropped to an average of 7.4. Where 50 children died in a city of 90,000, 12 died last year of diphtheria in a city of 182,000.

In 1906 the combined death rate from consumption among white and colored was 251 per 100,000. Last year the combined death rate was 112, less than half of the rate for 1906.

More remarkable and more original than the work in diphtheria and in tuberculosis have been Dr. Levy's results in reducing infant mortality and typhoid fever. Of every 1,000 babies born in Richmond in 1907, 213 died during their first year. Last year there were only 107 deaths for every 1,000 births.

In 1907 Richmond had 495 cases of typhoid and 47 deaths, a rate of 41.4. In 1923 there were 68 cases and only 11 deaths, a rate of 6.1.

Through virtually every phase of municipal health work the Richmond Health Department has been well balanced and has neglected few activities that promised actual betterment of the public health. Dr. Levy's amazing work goes on; the city will continue to benefit by his vision, his leadership as a sanitarian, and his research. But the man himself, though one of the most famous of American sanitarians, in the fullness of his career and more valuable to Richmond than ever—the man himself is lost to the city that needs him. And all because the voters preferred one man for mayor rather than another. There is something fundamentally wrong with a system that makes possible, much less inevitable, the retirement of such a man for so slight a reason. Confronted with that basic defect in the city's government, *The News Leader* does not know whether it should put first to-day its gratitude to Dr. Levy for his magnificent service to Richmond or its intense humiliation that Richmond consents to let him leave office.

EMPLOYMENT BUREAU

POSITION WANTED

Positions wanted announcements will be carried for individuals at a charge of $2.00 per insertion. Copy should be received at the New York office by the 8th of the month preceding publication.

Food Inspector with executive ability desires responsible position with either state, municipal or private corporation. Graduate of Class A veterinary college, year 1911. Formerly Assistant Chief and Chief Food Inspector in middle western city of 500,000. During World War served in U. S. Navy Food Inspection Dept., covering meat and dairy products. White, American, Protestant, age 34 years, excellent health. Address: 320 R. H., care of this JOURNAL, New York address.

Position wanted as health officer or assistant (if in city). Six years full time public health work, four years as chief executive, two years study in public health, one year at Johns Hopkins. Physician, married, active, references. Address 319 K. C., care of this JOURNAL, New York address.

Wanted: Position as assistant bacteriologist by registered nurse with B.S. in bacteriology. Has had experience in large city health department laboratory. Part-time work or permanent position in New York City preferred, but will consider any good opportunity. Address 323, care of this JOURNAL, New York address.

Wanted: Position as full-time health officer. Have had experience in city and rural health work, also army experience. Best of references available. Address 322, care of this JOURNAL, New York address.

Health Education: Young woman of 30 with 5 years' experience in many phases of health educational work on community scale, with industrial groups and in schools, desires position as director of health educational work in the east or south. Has done pioneer health work, public speaking, organization and executive work in community health. Familiar with racial and foreign groups. Address 321, care of this JOURNAL, New York address.

Position wanted by Ph.D. Pathologist and Bacteriologist. Graduate well-known Eastern University. Twelve years experience. Qualified for responsible position in public health work, teaching or laboratory. Am interested only in position important enough to automatically offer good salary. Address 324, care of this JOURNAL, New York address.

Position Wanted: Health officer with experience and record of good work, highly recommended, is open for position as city health officer in South or Middle West. Address 325, care of this JOURNAL, New York address.

HELP WANTED

Help wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the 8th of each month for publication on the 20th. Mail to New York office as early as possible.

In answering keyed advertisements, please mail replies separately to business office in New York City. In replying give age, professional training, salary requirement, previous positions held and three or more references.

Wanted: A full-time City Health Officer and Director of Health and Development, City School Department. Position will be open January 1, 1925. Send references and application, stating salary desired, to City Manager, Berkeley, California.

Wanted: A housing worker. State experience, when available and salary expected. Health Conservation Association, 417 Hall Bldg., Kansas City, Mo.

Wanted: Interne, Communicable Disease Hospital, Baltimore, Maryland. Six months service, Forty Dollars per month, with maintenance. Address 581, care of this JOURNAL, New York address.

BOOKS AND REPORTS REVIEWED

League of Nations Health Organization.—*Reports on Serological Investigations Presented to the Second International Conference on the Standardization of Sera and Serological Tests Held at the Pasteur Institute in Paris in November, 1922. This volume of valuable reports may be obtained from the World Peace Foundation, 40 Mt. Vernon Street, Boston 9, Massachusetts.*

Among the many commendable tasks of the Health Organization of the League of Nations is the standardization of therapeutic sera and serological tests. The first international serological conference with this end in view was held at the British Ministry of Health, London, in December, 1921. It was decided at that conference to undertake a study of the standardization of the following antisera: diphtheria, tetanus, meningococcus, pneumococcus and dysentery. It was also decided to make comparative studies of the various methods of the serum diagnosis of syphilis. As indicated in the title, this volume contains the reports on serological investigations of the second international conference held at the Pasteur Institute, Paris, in November, 1922.

The institutions which, under the League of Nations Health Committee, studied the standardization of diphtheria antitoxin were the Institute for Experimental Pathology, Frankfort; the Pasteur Institute, Paris; the State Bacteriological Laboratory, Rome; the Hygienic Laboratory, Washington, and the Danish State Institute, Copenhagen, the last institution, under the direction of Dr. Th. Madsen, having been designated as the Central Laboratory to which the results of all the experiments on standardization were to be submitted and where comparative studies of sera submitted by various state institutes should be made. The consensus of opinion of the committee representing these institutions, based on results of experiments in these institutions, fully presented in the reports, was that there was very little difference between the Ehrlich unit of antitoxin and the Hygienic Laboratory unit and that the Ehrlich unit should be adopted for use as an international standard. It was deemed very desirable by this committee "to induce firms in all countries to supply phials contained a fixed quantity of antitoxic units for preventive and therapeutic injections"; further, to "ask the various institutes and firms for samples of phials and have a report on the enquiry prepared for a later session."

The same institutions which investigated the anti-diphtheritic unit also studied the anti-tetanic unit. The standardization of this last unit, however, was found to be a task of greater magnitude. Four methods were found to be employed in determining the potency of anti-tetanic sera. These four methods were found to start "from different points of departure and experiments have not yet determined the exact relation between the units determined by each of these methods." Briefly, the committee felt that it was "desirable and possible to establish a common measure by an agreement on a single standard antitoxin, using the principle which has been adopted in connection with the standardization of the anti-diphtheritic serum." Important preliminary experiments were reported at the second international conference but it was believed essential to continue the experiments with the aim of defining, in detail, the technic to be used for the titration of standardized anti-tetanic serum.

Six institutes participated in the research on the standardization of anti-meningocccus serum, the Laboratory of the Ministry of Health, London, the Medical Research Council, the Pasteur Institute, Paris, the Danish State Institute, the Rockefeller Institute and the Robert Koch Institute, Berlin. Studies were carried out by these institutions on types of meningococci as well as on methods of measurement of antibody content and on the curative value of anti-meningococcus sera. The same institutions also studied the types of pneumococci and anti-pneumococcus serum. Preliminary reports are given and plans for further investigations on the various types of pneumococci and meningococci and on methods for determining therapeutic potency of the respective antisera are outlined. Concerning the occurrence of different types of

pneumococci, the report states that investigations have confirmed the three chief types, I, II, III, defined by the Rockefeller Institute.

The studies on dysentery were carried out by the Medical Research Council, the Pasteur Institute, Paris, the Hygienic Institute of Basle, the State Epidemiological Institute of Warsaw and by the Kitasato Institute of Tokio. Detailed methods for the study of anti-dysentery serum, with a view of standardizing the various procedures involved, were presented at the conference and are outlined in the Report under discussion.

With regard to the serum diagnosis of syphilis, it was decided at the first international conference (1921) to undertake comparative examinations of the Wassermann, Sachs-Georgi, Meinicke (Third Modification) and the Sigma Reaction of Dreyer and Ward. All investigations had to contain, among others, the following points of information regarding each method: Reliability of the method, complexity of technic, relative consumption of time and expense, ease and accuracy with which the reaction could be observed, percentage of dubious results and the extent to which the method yielded quantitative results. Comparative investigations of the above serological methods were carried out by the Medical Research Council, the Danish State Serum Institute, the Pasteur Institute of Brussels, the State Epidemiological Institute of Warsaw, the Institute for Experimental Pathology of Frankfort, the Cancer Research Institute of Heidelberg, the Pathological Institute of Oxford and the Serological Laboratory of the University of Vienna. The reports of these institutions as presented at the second international conference, while not definitely in favor of any single method, bring out forcibly the importance of international research in this field. These studies are being continued and will undoubtedly bring forth valuable information as to the superiority of any one method or group of methods.

Stedman's Medical Dictionary.—*By Thomas Lathrop Stedman, A.M., M.D. New York: William Woods & Co.*, 1924. Pp. 1146. Price, $7.00; Thumb Indexed, $7.50.

The lexicographer of a rapidly developing science has no easy job. Almost before one edition of his dictionary is off the press hundreds of new words have come into use and a revision must be begun at once. This volume has kept pace with the developments of medicine. It has been a valuable agent in promoting that development by standardizing the new terminology as soon as it was created out of the necessity of advancing knowledge.

As with previous editions, the editor was confronted with the problem of making room for the hundreds of new titles without increasing unduly the size of the book. The problem was solved by omitting the entries regarding the mineral springs of this country and Europe. Many of the new terms relate to dentistry. This is a desirable addition and holds forth the promise that future editions will likewise take increasing account of the various medical specialties.

The Leucocyte in Health and Disease.—*C. J. Bond, Fellow of University College, London; Member of the Industrial Fatigue Research, etc. London: H. K. Lewis & Co.*, 1924. First Edition, pp. 83 with 48 Illustrations in 24 Plates.

This is an unusually interesting and timely book and brings our knowledge of the living leucocyte much more up to date. These studies consist of a number of individual studies so connected up as to present a cohesive view of the subject in its entirety, in so far as the work has progressed.

These studies have been conducted along both chemical and morphological lines. The chemical portion of the book is interesting and opens up many lines of research along other lines. The morphological studies were made for the most part with both fixed and living cells stained with iodine and examined under optimum conditions under the higher powers of the microscope, using dark field illumination. The descriptions of the pseudopodial activities of the leucocytes and their ability to throw out dendrites in vitro, are of particular interest, as well as the production from leucocytic agglutination (or coalescence) of "giant cells," about which there has been much controversy in the past.

The plates are excellent. On the whole, the work is beautifully done, and the book is especially commended to the care of all laboratory workers.

PUBLIC HEALTH NOTES

STATE

New Jersey

Dr. Henry B. Costill was appointed Director of Health at a meeting of the State Department of Health on September 16, 1924, to take office on October 1, 1924, when Dr. J. C. Price has asked to be relieved of his duties as Director. Dr. Costill is a past president of the State Medical Society, a former member of the State Board of Medical Examiners, and during the war had supervision over the Medical Advisory Boards of the state.

Dr. J. C. Price, Director of Health of New Jersey since 1915, has resigned because of a protracted illness. His resignation was accepted by the Department with keen regret, and only after it was known that Dr. Price could not be persuaded to reconsider his decision. He was appointed a member of the State Board of Health by Governor Wilson in 1912 and served one year, when he resigned to accept appointment as Secretary of the Board. Upon the creation of the new Department of Health in 1915, he was appointed Director of Health for a term of four years and was reappointed by the Department in 1919 and again in 1923. His term of office had he continued would have expired in 1927.

The New Jersey State Department of Health has created a Bureau of Tuberculosis, and appointed Dr. H. B. Dunham as bureau chief. Mr. Dunham has devoted most of his life to the study of tuberculosis, having been an examiner for the New Jersey State Sanatorium for twelve years and in charge of a county tuberculosis campaign for five years.

The New Jersey State Department of Health has granted permission to the clammers in the vicinity of Atlantic City to remove seed clams from the polluted waters in which they were found, to clean waters where they can be grown for two years, when they will attain a marketable size. The State Department, which condemned the area in which the enormous strike of seed clams was found, will supervise the removal of clams to prevent the taking of any that might possibly be large enough to sell, since such clams would be dangerous to health.

Since July 26, six persons have died from smallpox in New Jersey. Previous to that time their had been no deaths since 1915. The State Department of Health has warned local health officials of the need for general vaccination.

In the October issue of the *Public Health News*, published by the State Department of Health, there appear two excellent papers one by Abraham Zingher, M.D., Dr.P.H. Assistant Director of the Bureau of Laboratories, New York City Department of Health, on the Dick test, and the other by Dr. Rowland G. Freeman, Jr., on the prophylactic and therapeutic use of measles convalescent plasma.

Ohio

Cincinnati has had 213 cases of smallpox since January 1. The Negroes, who constitute approximately 9 per cent of the population, contributed over 70 per cent of the cases. Of the 213 cases, all of whom were segregated at the Cincinnati General Hospital, 194 had never been vaccinated. The balance gave a history of having been vaccinated from ten to twenty years ago.

The outstanding feature of smallpox in Cincinnati is that there have been no cases among children attending school. In the Harriet Beecher Stowe school—exclusively for colored children in the down-town center of the colored population—they had no smallpox because the children are all vaccinated.

The city is under many obligations to its merchants, leaders of industry, civic organizations, the physicians of Cincinnati, and the press for their wonderful assistance in the campaign to raise the mass immunity against this disease.

In the last four or five months 75,000 people have been vaccinated in response to appeals, without cost to the city of Cincinnati. The work has been done entirely by the physicians of the city. Much of the work was financed by the employers, and in many industries and mercantile establishments evidence of successful vaccination has been made a requirement for employment. The last case of smallpox was reported on August 20th.

PUBLIC HEALTH ADMINISTRATION

[The Associate Editor in charge of this department of the JOURNAL has been endeavoring during the last few months to secure some expression of opinion from the readers of the JOURNAL relative to their interest in this section. As this section deals with one of the most important phases of public health work it seems unlikely that his comments in this section have gone unnoticed even though interest has not manifested itself. The Editor, as well as the Associate Editor, is anxious to develop this section along lines that will be of greatest interest and usefulness to health officers and other administrators. Instead of the abstracts which customarily appear in this section, therefore, the following letter from Dr. Harris, the Associate Editor, is published. Comments on this letter are cordially invited. Such comments may be addressed to the Editor or the Associate Editor at the address given in the letter. These comments will be helpful in determining the future editorial policies of this section.—EDITOR.]

DEPARTMENT OF HEALTH
CITY OF NEW YORK
NEW YORK, October 14, 1924.

To the Editor,
American Journal Public Health,
370 Seventh Avenue,
New York City.

It is apparent that the section of the JOURNAL devoted to abstracts of special interest to public health administrators has either lacked value or the contributions have not been presented in a sufficiently interesting manner. During the past six months, no Fellow or member of the Association has given any evidence of interest in this section. I do not believe that we should continue to devote time and effort to a feature that is apparently of no distinct value; or, if the fault be in the lack of forcible presentation, why not make a radical change?

Possibly health officers who have zeal for their work obtain for themselves the information that is furnished in abstract in this section of our JOURNAL. Or, perhaps what seems indifference on the part of the Fellows and members, is due rather to the exercise of discriminating judgment, in which event their seeming lack of interest in the section of the JOURNAL which I have been editing is to be commended. It suggests the thought, however, that as an Association we might profit by taking under advisement a departure from fixed custom whose observance may have tended to make the JOURNAL seem uninspired and unattractive in some of its features.

I would be exceedingly glad to have you utilize this letter in any way you may deem best to elicit an expression of opinions of the readers. It is possible that they would be interested in a different type of material than I have been preparing. In any event, without some understanding of what is desired I am unwilling to continue to prepare material in which there has been so little interest manifested.

Very truly yours,

LOUIS I. HARRIS, M.D., DR.P.H.,
Director, Bureau of Preventable Diseases.

PUBLIC HEALTH LABORATORY NOTES

C. C. YOUNG

Toxic Substance in Scarlet Fever.—The serum of persons ill with scarlet fever contains a toxic substance which produces a bright red local erythema when injected subcutaneously in persons who have not had scarlet fever and whose serums fail to blanch the rash in scarlet fever. This is not neutralized by mixing with human serum which gives a negative blanching test but is readily neutralized by serum giving a positive blanching test. It is not neutralized by normal horse serum but is by Dochez scarlatinal antistreptococcic serum. A similar toxic substance was found in two out of five urines from patients with scarlet fever.—Trask and Blake. *Jr. Exp. Med.*, 40:381 (Sept.), 1924. M. S. M.

Tuberculosis of the Knee.—Differential diagnosis is discussed with a recommendation that tissue be examined for the purpose of establishing a positive diagnosis or confirming other findings. The author has found that in 90 per cent of the cases that a stained section of the tissue from the diseased area will reveal the diagnosis and recommends that an animal inoculation of the tissue be made.—Nathaniel Allison, *Jour. A. M. A.*, 83:750 (Sept. 6), 1924. M. C.

Cultivation of Tubercle Bacilli.—The observations of twelve years of experience in the cultivation of the tubercle bacillus, and in the inoculation of guinea pigs as a diagnostic test, are summarized in this interesting and essentially practical paper.—Corper, *Jr. Lab. & Clin. Med.*, 9:766 (Aug.), 1924. M. S. M.

Effect of Guinea Pig Tissues in Vitro upon Virulent Tubercle Bacilli.—The authors carried on a series of experiments to determine the effect of guinea pig tissue on tubercle bacilli. It was found that virulent human tubercle bacilli, contained in tubercular lymph nodes removed from guinea pigs and kept in sterile saline at incubator temperature, lose their infective power for guinea pigs in less than two weeks. During incubation of normal or tubercular guinea-pig tissues in vitro there is found a product within two weeks in water soluble form and of a toxic nature to virulent human tubercle bacilli. Different normal tissues form the tuberculo-toxic substance in different strength, voluntary muscle being apparently the more active, the toxicity of its filtrate being sufficient to abolish the virulence of tubercle bacilli in one day. The final hydrogen-ion concentration of the mixture plays no part in its toxicity to tubercle bacilli.—Corper, Lurie and Kretschmer, *Am. Jr. Hyg.*, 4:77 (March), 1924. H. B.

Soluble Specific Substance of the Pneumococcus. II.—The method for the concentration and purification of the soluble specific substance of pneumococcus has been improved. Highly purified specific substance of Type II pneumococcus of polysaccharide nature is shown to be recovered essentially unchanged after precipitation by immune serum, by uranyl nitrate, by basic lead acetate, or by safranine. Marked chemical differences are shown to exist between the specific substances of Type II and Type III pneumococcus, although both react as polysaccharides. The weight of evidence is considered to be in favor of the view that the specific substances of Pneumococcus Types II and III are actually polysaccharide derivatives. The immunological significance of the foregoing is discussed.—Heidelberger and Avery, *Jr. Exp. Med.*, 40:301 (Sept.), 1924. M. S. M.

Uric Acid Content of Spinal Fluid.—In a study of 51 cases, the author finds the average uric acid to be 0.78 mg. per 100 c.c. of fluid for children, 0.54 mg. for adults. The average in chorea was 0.78 mg., with the sugar content within normal limits. Syphilitics had an average uric acid of only 0.40 mg. In uremia, uric acid and other nonprotein nitrogenous elements were increased. In one case of congenital hydrocephalus the uric acid was 1.48 mg. All cases of severe infection show an increase in uric acid, and a decrease in sugar. The average concentration of uric acid in 35 cases was 22.1 per cent of the blood concentration.—Bernhard, *Jr. Lab. and Clin. Med.* 9:753 (Aug.), 1924. M. S. M.

Persistence of Inspired Bacteria in Lungs.—When mice are exposed to an atmosphere containing certain bacteria in the form of a fine mist, the bacteria may be recovered from the deeper respiratory passages. Pneumococci which have reached the lungs of normal mice as a result of this procedure usually disappear within a few hours and give rise to no generalized infection. In mice intoxicated with alcohol, on the other hand, pneumococci persist in the lungs for a longer period, and fatal septicemia frequently follows. Hemolytic streptococci and *B.influenzae* generally persist in the lungs for about 24 hours. In intoxicated mice these organisms do not disappear so rapidly from the lungs and generalized infection is much more frequent. The experiments yield no evidence as to how alcoholic intoxication renders the lungs more permeable to inspired bacteria.—Stillman, *Jr. Exp. Med.*, 40:353 (Sept.), 1924. M. S. M.

Species of Streptococci.—Schotmüller considers differentiation of various species of streptococci as important as differentiation between any germs. His anaerobic streptococcus putrificus is the cause of more than one-third of the puerperal infections. In the thirty years of his continuous observation he has yet to see a single instance in which a streptococcus (hemolytic, for example) had changed in human beings into another form (the viridans for example). He has never denied that the latter may have some hemolytic action. Ruge's and Phillips' methods of prognosis of infections from the bactericidal action of the serum are regarded skeptically, both for theoretical reasons and on the basis of his diverging results. The site of the infection and not the bactericidal action of the blood determines the outcome.—Muncherier, *Med. Woch.*, 71:1009 (July), 1924; *Jour. A. M. A.*, 83:800 (Sept. 6), 1924. C. C. Y.

Visceral Infection Due to Bacterial Infection of Apparently Normal Respiratory Tract.—Cases of myocarditis, endocarditis, cholecystitis, appendicitis, and pyelitis were studied to determine the relation of the bacterial flora of the upper respiratory tract to visceral disease. By means of the pathogen-selective method of culture, in which culture is made in patient's whole coagulable blood, it was possible to determine whether or not microörganisms present in a patient were pathogenic for him, and thus to differentiate infection from infestation. The upper respiratory tract was found to be the site of focal infection without exhibiting visible alteration in structure. The technique for the pathogen-selective culture is given as well as for preparation and administration of bacterial vaccines.—Myer, Solis-Cohen, *Jour. A. M. A.*, 83:824 (Sept. 13), 1924. C. C. Y.

Experimental Studies in Yellow Fever.—Two strains of Leptospira icteroides were isolated from two of nine cases of yellow fever in an interior town in Brazil, by inoculation of suitable culture medium with blood drawn on the first and second days of illness. The characteristic pathogenicity of the Brazilian strains of Leptospira icteroides was established by experiments with guinea pigs taken from New York. Pathogenicity for monkeys and young dogs was demonstrated and filtrability was established. Immunological studies were also made.—Noguchi et el, *Jour. A. M. A.*, 83:820 (Sept. 13), 1924. C. C. Y.

Examination of Stools of Food Handlers.—Of 6,143 examinations of stools of apparently healthy individuals in Manila, two were found positive for typhoid bacilli. Of the convalescents and contacts, 19 were found to harbor typhoid bacilli, one paratyphoid A bacilli, and 22 dysenteriae bacilli. The technique was as follows: A small portion of freshly collected feces was incubated in nutrient broth for 3–5 hours and then streaked on plates of Teague methylene blue eosin medium, litmus agar and Endo's medium. After 12–24 hours incubation, they were examined for suspicious typhoid and dysentery colonies. Suspicious colonies were transferred to modified Russell's double sugar medium and microscopic agglutination tests were made. Confirmations were made by macroscopic agglutination and inoculating differential carbohydrate medium. For the detection of cholera a small portion of the stool was emulsified in the following medium: 1 per cent Witte's peptone and .5 per cent NaCl in tap water. After 18–24 hours incubation of the inoculated tube, cultures were examined for motility and plated on Dieudonne's medium.—Garcia, Vozquez, Colet and Lacy, *Philippine Jr. Science*, 24:735 (June), 1924. M. C.

Effect of pH in Colloidal Benzoin and Gold Tests.—A systematic-study of the effect of H-ion concentration on the precipitation of these colloidal solutions by cerebrospinal fluid is made. The relationships between tube numbers and pH are represented by a clean-cut curve between pH 8.7 and 4.2 for colloidal benzoin, and between 7.4 and 6.4 for colloidal gold. The alkalinity of the spinal fluid, the dilution, and the pH of the colloidal solution are factors affecting this curve.—Shaffer, *Jr. Lab. & Clin. Med.*, 9:757 (Aug.), 1924. M. S. M.

A Mixed Indicator for Carbonate and Bicarbonate Titrations.—The use of phenophthalein for the first end point in carbonate and bicarbonate gives high results because of the very gradual change in color. In order to get more marked changes in color at this end point a mixed indicator was suggested. This consists of a mixture of one part by weight of cresol red (pH range 8.8 to 7.2) and 6 parts thymol blue (pH range 9.6 to 8.0). Bromphenol blue was used with these for the second end point. The use of these mixed indicators gave marked changes in color and excellent results. The indicators were prepared as follows: 1. Thymol blue 0.03 g.+1.42 c.c. 0.05 N NaOH diluted to 25 c.c. 2. Cresol red 0.01 g.+0.58 c.c. 0.05 N NaOH diluted to 25 c.c. 3. Bromphenol blue 0.02 g.+0.66 c.c. 0.05 N NaOH diluted to 25 c.c. Mix the first two in proportion of 1 to 2 and use 3 drops. Use 4 drops of the third.—S. G. Simpson, *Jr. Ind. & Eng. Chem.*, 16:709 (July), 1924. E. F. E.

Volumetric Determination of Magnesium.—The pptn of Mg $(NH_4)_2$ Fe(CN)$_6$ from soln contg Mg++ & Fe(CN$_6$) in the presence of NH_4 salts is utilized for detg Mg volumetrically. When cold, pptn occurs only in concd. soln, but it is complete in hot dilute solns. with excess of NH_4 salt and EtOH, though a direct columetric detn could not be developed because of the difficulty of reading the end point. Procedure: To the Mg soln. add an excess of $K_4Fe(CN)_6$ and of solid NH_4Cl, heat at 100° for 5–10 min., add approx. 0.05 vol. of EtOH and while hot titrated the excess $K_4Fe(CN)_6$ with 0.1 N$ZnSO_4$. The end point is reached when a drop of the supernatant liquid is not colored rose by a U salt. A drop of 0.1 N $ZnSO_4$ is sufficient in the titration to transform the rose color to a clear green and the point is sharper than that in the titration of Zn by the Galletti method. Reaction Mg $SO_4+K_4Fe(CN)_6+2NH_4Cl=(NH_4)_2MgFe(CN)_6+2KCl+K_2SO_4$; Zn $SO_4+K_4Fe(CN)_6+2NH_4Cl=(NH_4)_2ZnFe(CN)_6+2KCl+K_2SO_4$.—Bulh and Fernandes, Ann. Chem. Applicata, 13:44 (1923). *Am. Chem. Soc. Abstracts*, 17:3655 (Nov.), 1923.

Bacillus Botulinus and Bacillus Tetani in Soil.—Cultures were made of soil, using a meat mash medium containing 1 per cent of glucose and incubated at 37° for two or three days. Cultures were then filtered through Berkefeld or Mandler filters and filtrate was tested for tetanus and botulinus toxin by animal inoculation. In typing botulinus toxin, three animals for each being protected with one type of botulinus antitoxin were used for each sample. In typing tetanus toxin, two animals for each sample were used, one receiving no antitoxin and the other receiving type A botulinus antitoxin. Of twenty samples of arable soil, 70 per cent gave toxin filtrate, 50 per cent contained botulinus type A, 15 per cent contained B. botulinus type B, 20 per cent contained B. tetani and 30 per cent gave no evidence of toxin-forming anaerobes.—I. C. Hall and Emelia Peterson, *Jr. Bact.*, 9:201 (May), 1924. E. S.

Further Observations on Liquefaction of Gelatin by Bacteria.—The authors, while working on the gelatinolytic properties of bacteria, by the viscosity and formal titration method, observed that autoclaved gelatin when stored at 22° C. changed very little in viscosity for a few days and then increased. Experiments were carried out to determine whether or not gelatin stored at various temperatures for prolonged periods would yield products of constant viscosity. It was found that gelatin stored at 10 to 22° C. from two to seventeen days may be rendered constant by preheating the gelatin at 50° C. before making viscosity reading. Gelatin stored at 41° C. retains a constant viscosity for ten days after which it decreases slowly. Gelatin at temperatures below the gelatin point is rendered constant by preheating at 41° to 51° C. The change in viscosity and formal titration is used for detecting proteolysis by mesophilic and thermophilic bacteria.—Max Levine and F. W. Shaw, *Jr. Bact.*, 9:225 (May), 1924. E. S.

Spectroscopic and Chemical Demonstrations of Occult Blood in the Feces.—Snapper's reaction: The feces are placed in a mortar and extracted with acetone. This withdraws much of the coloring matter and water, leaving a dry mass that is quite susceptible to spectroscopic analysis. The dry residue is transferred to a clean mortar and rubbed up thoroughly with a mixture of one part of glacial acetic acid and three parts of ether, preferably ethyl acetate. After filtration, a quarter volume of pyridin is added, then a drop of ammonium sulphide solution. This is examined spectroscopically. If blood is present, a hemochromogen spectrum band will be found on the boundary between yellow and green. Gregersen's chemical method: Two reagents are required, *i.e.*, a prepared powder mixture consisting of 0.025 gms. of benzidin and 0.20 gms. barium peroxid and 5 c.c. of 50 per cent solution acetic acid. Both will keep separately indefinitely. The test solution is obtained by placing the benzidin-barium powder into the acetic acid. The feces are then spread on a glass slide, and from 2 to 4 drops of the benzidin-barium-peroxid-acetic acid reagent is dropped on them. If pathologic blood is present, there appears within one minute a greenish blue or a blue. The color is easily detected on placing the glass slide on a white background. In order to make sure of the activity of the benzidin solution, Gregersen prepares a blood test paper. If, when a drop of the benzidin solution is placed on the paper, the latter turns deep blue, this is proof positive that the benzidin reagent is in proper condition.—Chas. D. Aaron, *Jour. A. M. A.*, 83:741 (Sept. 6), 1924. O. M. M.

NOTE: Each month we desire to publish in the Laboratory Notes two or three short articles (not exceeding 250 words) dealing with some phase of applied bacteriology, labor saving devices, modified methods, etc. Contributions should be in the hands of associate editor before the fifteenth of each month.—C. C. YOUNG.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Mortality Record First Six Months of 1924.—The first six months of 1924 have probably registered a lower death rate than was ever experienced for the first six months of any year in the history of the United States and Canada. This is indicated by the mortality records of the more than 15,000,000 industrial policyholders of the Metropolitan Life Insurance Company. Among the most gratifying items in the record for the half-year are the declines in the mortality from the diseases which are of interest in public health and insurance medicine. The typhoid fever rate is still falling, and there is promise that a new minimum will be registered in 1924. Diphtheria mortality in the industrial population has been running lower than ever before. Scarlet fever and whooping cough show practically the same death rates as for the corresponding period of last year, no doubt due to the greater number of infant lives included in the company membership for 1924. The higher rates from bronchial pneumonia and the diarrheal diseases are explained on the same ground. There has been no general prevalence of epidemic influenza so far. The mortality from lobar pneumonia decreased markedly among the white policyholders and slightly among the colored. An encouraging decline was seen among white women in the mortality from diseases incidental to pregnancy and childbirth and more particularly from puerperal septicemia. Automobile accidents continue to increase.—*Statistical Bulletin*, Metropolitan Life Insurance Company, August, 1924.

Health Record for July 1924.—The general death rate for the large cities of the United States during July was 10.9 per 1,000, which is slightly lower than the June figure but a little higher than that for July of last year. Comparisons with conditions in June show reduced prevalence of diphtheria, influenza, measles, smallpox and of scarlet fever; increases are reported in cases of malaria, typhoid and whooping cough, which, in each instance may be regarded as seasonal. As compared with July, 1923, there was more malaria, scarlet fever, smallpox and typhoid fever but less measles and diphtheria. Anthrax cases have been reported in considerable numbers in the South Central States. Poliomyelitis was reported from 16 states.

The July death rate among the Metropolitan industrial policyholders (8.4 per 1,000) was identical with that for July, 1923. In these two years, the death rate for July was the lowest ever recorded in this cross-section of the American and Canadian populations. Practically all of the principal causes of death registered lower death rates than for June. The exceptions were whooping cough, diarrheal diseases, homicides, accidents and automobile accidents. The most notable favorable items in the July mortality report are the continued low rates for the epidemic diseases of childhood, for tuberculosis and the "degenerative diseases."—*Statistical Bulletin*, Metropolitan Life Insurance Company, August, 1924.

Vital Statistics, England and Wales.—The births registered in England and Wales for the second quarter of 1924 correspond to an annual rate of 19.5 per 1,000. This is the lowest birth rate recorded in any second quarter except during the war. The death rate was 11.9 per 1,000. Influenza was either a primary or a contributory cause of death in 3.7 per cent of total deaths. The infant mortality was 69, being 13 below the average of the ten preceding second quarters. The marriage rate was 9.8.—*Med. Off.*, 32:102 (Aug. 30), 1924.

Scottish Vital Statistics.—The birth rate of Scotland for the second quarter of 1924 was 23.1 per 1,000, 0.4 more than for the previous quarter, but 0.7 less than that of the corresponding quarter of last year, and is less than the rate of each second quarter since 1919. The marriage rate of 6.6 shows a rise of 0.6 compared with that of the previous quarter, but a fall of 0.7 when compared with that of the second quarter of last year. The death rate, 14.8, was 3.3, less than that of the previous quarter, but 1.4 more than that of the second quarter of 1923. It is about the same as the mean of the rates of and second quarters of the last ten years. The rise in the death rate as compared with the second quarter of last year is explained by an increased number of deaths from influenza, pneumonia, bronchitis, measles, and whooping cough. The infantile mortality rate of the quarter was 93 per 1,000 births as compared with 132 for the first quarter and 79 for the corresponding quarter of 1923.—*Med. Off.*, 32:98 (Aug. 30), 1924.

Vital Statistics in France 1918–1923.—During the period 1918-1923 the tuberculosis mortality in 53 departments of France varied greatly in different localities. In the department of the Marne there were only 2.51 deaths from tuberculosis per 10,000 persons, whereas, in the department of the Rhone the rate was as high as 38.6 per 10,000. The incidence in the various districts of Paris is very patchy, endemic in some quarters and hardly known in others. In 1918 there were 293 deaths from pulmonary tuberculosis per 100,000 population in Paris. The rate has steadily declined and the corresponding figure for 1923 was 231. Cancer in Paris has risen, however, from 115 deaths in 1918 to 123 deaths in 1923 per 100,000 population. The death rate from typhoid fever has fallen from 5 in 1918 to 0.7 in 1923, that from measles from 8.7 to 1.6, scarlet fever from 1 to 0.3, whooping cough from 10.5 to 0.6, and diphtheria from 4.5 to 0.5. In France as a whole, the general death rate has fallen from 19 in 1919 to 17 per 1,000 in 1923, and the infant mortality rate from 119 in 1919 to 96 in 1923. In 1922 the rate was 85.—*Lancet* 2:404–405 (Aug. 23), 1924.

Public Health in Mauritius, 1922.—The estimated population of Mauritius was 377,594 on December 31, 1922. The birth rate was 37.0 per 1,000 as compared with an average of 36.2 for the quinquennium, 1918–1922. The death rate was 34.5, a distinct improvement on the quinquennial average of 42.0. The infant mortality fell from 179.7 in 1921 to 147.9 in 1922. The chief cause was congenital debility. There were 224 notifications of enteric fever of which 106 were in Port Louis. Plague is endemic. Only 98 cases occurred in 1922, as compared with 375 in 1921. The mortality from pulmonary tuberculosis was 1,076 and for all forms of tuberculosis 1,083, as compared with 1,027 and 1,076, the quinquennial averages.—*Lancet*, 2:305–306 (Aug. 9), 1924.

Mortality in Germany 1923.—Since 1921 the death rate of Germany has remained at a minimum that had not previously been attained. The large cities and the smaller towns owe their present low death rate mainly to the changes in demographic conditions, in that the proportion of persons found in the strong and sturdy age groups has increased markedly at the expense of the weaker elements, the

children and the aged. When the birth rate of the domiciled population drops to 14.2 per 1,000 as was the case in the large cities for 1923, it is not surprising that the percentage of children dying out of such a low birth total had only a very slight effect on the average death rate. The general death rate of England has always been lower than that of Germany, because the infant mortality was lower. In 1921 the infant mortality rate in England was 83 while that of Germany was 134.—*Jour. A. M. A.*, 83:373 (August 2), 1924.

Vital Statistics in Holland 1923.—Although the birth rate, 26 per 1,000, and the marriage rate, 8 per 1,000, have remained essentially the same as for the years immediately preceding, there is a noteworthy decrease in the mortality rate for 1923. The figure is 9.9 per 1,000 inhabitants, a record which has never been previously attained and which is 1.5 lower than the rate for 1922. If one compares the figures of the preceding decades, he will find that the mortality is but little more than a third of what it was in 1840, 26.6.

The decrease in the infant mortality rate has been similar. Around 1880, the infant mortality rate was 190 per 1,000 living births. It reached the lowest figure in 1923: 56.9 per 1,000, or 10.4 lower than that of 1922. The mortality from tuberculosis has fallen from .86 per 1,000 in 1922 to .79 in 1923.—*Jour. A. M. A.*, 83:134 (July 12), 1924.

Public Health in Sydney, New South Wales.—The population of Sydney is approximately 1,000,000, and in 1922 the birth rate was 23 per 1,000. The remarkably low death rate of 8 per 1,000 prevailed, and there was an equally satisfactory infant mortality rate of 66 per 1,000 births. Of 8,000 deaths from all causes, over 1,000 were due to diseases of the heart, nearly 900 to cancer, 500 to pneumonia, and the same number to Bright's disease and tuberculosis. There were 35 cases of plague and 8 deaths.—*Med. Off.*, 32:26-27 (July 19), 1924.

Prenatal Work in Detroit, 1923.—During 1923 more than 6.5 per cent of all pregnant women in Detroit attended the prenatal clinics of the Department of Health, most of them late in pregnancy. The maternal death rate was 3.1 per 1,000 births as compared with 6.6 per 1,000 for the city at large. The death rate per 1,000 births of babies under 1 month was 40.6 for Station No. 1, while for the city at large it was 43.7. This may not seem a very great difference, but if the deaths are separated by color, the white babies under 1 month with prenatal care at Station No. 1 showed a death rate of 27.2 per 1,000 living births, and the colored babies under the same conditions had a rate of 44. In the city at large the white babies had a rate of 42.9 and the colored 67.9. The stillbirth rate per 1,000 births for Station No. 1 was, for the colored 42.2; in the city at large the rate for the colored was 121.5.—*Detroit Monthly Bull.*, 7:3-7 (April-May), 1924.

The Vital Capacity of the Lungs and Its Significance in Hyperthyroidism.—A study of 13 males and 44 females, 48 of whom were diagnosed as exophthalmic goiter and 9 as toxic adenoma, was made to ascertain the vital capacity in hyperthyroidism. The patients were seen either in hospital or dispensary service, and their age limits varied from 11 to 59 years. All patients with high basal metabolic rates, with one exception, showed very definite reduction of the vital capacity below 70 per cent of normal. On the other hand, in patients with lower rates, death occurred only in those whose vital capacity was below 70 per cent of normal. In the patients studied, prognosis would appear to depend not so much on the degree of increase of the basal metabolism above 30 per cent as on the reduction of the vital capacity below 70 per cent of normal. The vital capacity reduction has, therefore, distinct prognostic value. The reduction in vital capacity in the cases studied appears to be due to cardiovascular insufficiency. It seems reasonable to consider that decreased vital capacity and increased pulse rate are partly of myocardial origin. This is indicated by the preponderance of cardiac signs and symptoms in the patients with marked dimunition of the vital capacity. The minute volume of pulmonary ventilation at rest was not a factor of the vital capacity.—C. A. Kinlay, *Arch. Int. Med.*, 34:168-176 (Aug. 15), 1924.

SANITARY ENGINEERING

ABEL WOLMAN, C.E.

The Financial Program for the New Water Works in the Small Town.—In discussing the installation of a water supply, an engineer should be employed to report on the best supply available, the cost of the works complete and annual operating expenses; then a definite plan for revenue should be decided upon before incurring a thirty year debt upon the town. Four examples, based upon towns of 1,500 population, giving costs and water rates are given.—Richard Messer, *Am. City*, 37:187 (Sept.), 1924. A. W. B.

Filter Sand for Municipal Water Supplies.—Filter sand may be prepared from ocean beaches, lake deposits, river bars, sand banks and soft sandstone, the method of excavation depending largely on the nature of the deposit. In addition to being clean and free from clay and organic matter, it must be of uniform size, so careful screening is necessary. Sands with effective sizes of 0.20 to 0.70 mm. are used, but those most commonly specified are from 0.40 to 0.55 mm. The uniformity coefficient varies from 1.25 to 1.80 with 1.55 to 1.60 as an average.—W. M. Weigel, *Am. City*, 31:193 (Sept.), 1924. A. W. B.

The Work of a Suburban Sanitary Commission.—More than a dozen years ago the need for collective action near Washington was becoming manifest. Growing towns were having difficulty in developing adequate and safe sources of water supply; real estate operators in unincorporated areas were constructing hopelessly inferior community water and sewerage systems; streams were becoming fouled, and the only hope was the development of comprehensive projects for the whole suburban section. The Washington Suburban Sanitary District, created in 1918, has control over all water supply, sewerage, garbage and refuse disposal, plumbing, and street planning in an area of 95 square miles. Schedule of charges to various properties shows the low cost of $25 a year for water, using 50,000 gallons of water annually, and sewerage service, to a residence on a 50 foot lot assessed at $5,000.—Robert B. Morse, *Am. City*, 31:219 (Sept.), 1924. A. W. B.

District of Columbia Recovers $302,631 from Garbage and Refuse.—For the year ending June 30, 1924, the city refuse division showed gross operating receipts of $302,631 against an expenditure for all purposes of $821,155; 75,089 tons of raw garbage were handled.—*Eng. News-Rec.*, 93:386 (Sept. 4), 1924. A. W. B.

Insurance Company Has to Pay Typhoid Death Loss on Accident Clause.—Illinois Supreme Court decision requires an insurance company to pay on accident policy for typhoid death which was contracted by drinking water under the belief that it was pure and wholesome. A faulty check valve permitted contamination to enter the drinking water from the industrial supply.—*Eng. News-Rec.*, 93:392 (Sept. 4), 1924. A. W. B.

Buffalo's New Filtration Plant.—The first section of the largest filter plant in America, having a total maximum capacity of 380 m.g.d., is rapidly nearing completion. The plant is built on land reclaimed from the lake, and covers 9 acres. Water passes from the coagulating basin to filters which are superimposed over the clear water basin.—George C. Andrews, *Pub. Works*, 55:271 (Sept.), 1924. A. W. B.

Modern Methods in Reservoir Building.—A description is given of methods employed in building Wanaque Dam for the North Jersey District Water Supply Commission.—*Pub. Works*, 55:289 (Sept.), 1924. A. W. B.

Separate Sludge Digestion.—The experiences of twelve years at Birmingham, England, is given. In 1911, thirty-nine septic tanks with a total capacity of 350,000 cubic yards were converted to primary and secondary sludge digestion tanks. Sludge is delivered to contractors who use it as a base for fertilizer.—*Pub. Works*, 55:293 (Sept.), 1924. A. W. B.

Fertilizing Value of Activated Sludge.—In experiments oats and corn showed a marked response to sludge. Used on lawns sludge proved to be superior to sheep manure. Results obtained indicate that activated sludge has definite fertilizer value.—Victor H. Kadish, *Canadian Eng.*, 47:313 (Sept. 9), 1924. A. W. B.

Analyzing Sewages and Sewage Effluents.—Methods used in making analyses are explained for the benefit of operators who have not received chemical training.—C. B. O. Jones, *Canadian Eng.*, 47:337 (Sept. 16), 1924. A. W. B.

Elasticity of the Activated Sludge Process. Following a period of four days when the power was shut off due to an accident, without harmful results, the power has been shut off for eight hours each night, giving better results at the Bury, Lancaster, England, activated sludge plant. Other experiments indicate that the process is very elastic.—Joshua Bolton, *Mun. & Co. Eng.*, 67:146 (Sept.), 1924. A. W. B.

American Practice in Refuse Disposal.—Reduction of garbage, hog feeding, incineration and Becarri process of refuse disposal and their operation and cost are reviewed. The need in America for more exact and far reaching data relating to the operation of refuse disposal plants as regards design is emphasized.—Samuel A. Greeley, *Canadian Eng.*, 47:297 (Sept. 2), 1924. A. W. B.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASES

DRS. E. R. HAYHURST and N. C. DYSART

Tuberculosis and Industrial Hygiene.—The history of tuberculosis in the United States in the last twenty-five years offers an excellent illustration of the effectiveness of the public health campaign. In this short period of less than one generation, the tuberculosis death rate has been reduced one-half. This corresponds to a saving of 100,000 lives a year from this condition alone, and the death rate still continues to decline. At the present rate of progress, it is entirely possible that by 1930 the death rate will have been reduced to well under 50 per 100,000.

The further control of tuberculosis would seem to be largely dependent upon the development of industrial hygiene. The death rate among adult or occupied males is now twice as high as it is among females, at the working ages. The high rates are, moreover, concentrated in a number of definite occupations which expose their workers to inorganic dusts, to the effect of poisons such as lead, to the influence of alcohol, to fatigue and to other hazards. The application of sanitary measures and the better organization of industry should bring large results quickly. Possibly no greater service could be rendered by the rank and file of American physicians than to contribute to the further reduction in the tuberculosis death rate. Their influence can be especially productive in industry by their service in popularizing periodic health examinations and in the general dissemination of higher standards of personal hygiene among their patients. A reduction in the mortality from tuberculosis to 50 per 100,000 will mean more families kept intact, more children raised to maturity, and more lives of men permitted to live through a normal expectation of useful, productive years. But with such reduced mortality from tuberculosis will also go lower incidence of the cardiovascular renal diseases which to-day reflect poor standards of personal hygiene.—Louis I. Dublin, "Some Problems of Life Extension," Metropolitan Life Ins. Company, 1924, p. 6.

Reorganization of Industrial Hygiene in New York.—The Division of Industrial Hygiene has been reorganized and is now operating under four sections: Expert Inspection, Special Research, Accident Prevention, and Education. The roster of the Division consists of Leland E. Cofer, M.D., Director; C. T. Graham-Rogers, M.D., Medical Inspector of Factories; May R. Mayers, A.M., M.D.,

Medical Inspector of Factories; Thomas J. O'Brien, M.D., Medical Inspector of Factories; Carroll M. Salls, B.S., Ph.D., Chemical Engineer; Fred H. Stebbins, M.D., Mechanical Engineer; and John H. Vogt, B.S., Chemist; three safety inspectors and seven factory inspectors. An Advisory Committee has been constituted with the following personnel:

Dr. W. Gilman Thompson, President of the Reconstruction Hospital, New York, Chairman.

Hon. Matthias Nicoll, Jr., Commissioner of Health of the State of New York.

Hon. Frank J. Monaghan, Commissioner of Health of the City of New York.

Dr. Orrin Sage Wightman, President New York State Medical Society.

Dr. Charles L. Dana, Chairman Public Health Committee, New York Academy of Medicine.

Dr. James Alexander Miller, President New York Tuberculosis Association.

Dr. George M. Price, Director Joint Board of Sanitary Control.

Dr. Louis I. Dublin, Chief Statistician of Metropolitan Life Insurance Co.

Dr. Leland E. Cofer, Director Division of Industrial Hygiene, New York State Department of Labor.

The underlying object of the *Monthly Bulletin* which the Division publishes is to aid in conservation of industrial life, as a medium of information to the medical profession, the employers and the employees. The chief problems immediately confronting the Division are described in a brief statement by Graham-Rogers in the first issue of the *Bulletin*. Investigations are to go at once into the main health hazards and occupational diseases as well as the development of a standard nomenclature. An Industrial Hygiene Clinic has been organized jointly with the Reconstruction Hospital and the College of Physicians and Surgeons at the corner of 100th Street and Central Park West, New York City. Physicians desiring to refer cases of suspected occupational diseases should write to The Director, at this address. Two field lecturers for industrial hygiene are maintained and their services procurable by manufacturing interests upon application. "A Ready Reference Pocket Manual on Industrial Diseases" has been prepared for the use of physicians.—*Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, I, No. 1 (July), 1924.

Investigation of Lead Poisoning.—The author describes the plan of the new Division of Industrial Hygiene in New York State for the investigation of lead poisoning. He gives a list of one hundred and thirty-six occupations in which there may be exposure to lead. He regards the list given in *Bulletin* 306, U. S. Dept. of Labor, as complete. As a working problem the industries to be investigated at the beginning number thirty. After completing the Greater New York District, the upstate counties will follow. The items included in the statistical blank for inquiry are given.—Graham-Rogers, *Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, I, No. 2 (Aug.), 1924.

CO Poisoning in Laundry Workers.—Dr. Mayers examined the blood of seven operators on gas-heated body ironing machines in steam laundries in New York City and found carbon monoxide in amounts varying from 10 to 25 per cent. The women complained of symptoms which were undoubtedly those of carbon monoxide poisoning—indigestion, with eructations and marked distention, a metallic taste in the mouth, headache and profuse sweating which continued throughout the night. Examination showed the women's lungs and sputum negative for tuberculosis. One woman coughed up a black colored sputum probably coming from the fine particles of carbon which become deposited on the inside of the iron.—May R. Mayers, *Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, I, No. 2 (Aug.), 1924.

Sick Absence.—Sickness is today the greatest single cause of lost time in industry and mercantile life. It is costly both to the business in lost time and interference with team work, and to the workers in wages, human energy and suffering. "The British health insurance table shows at least 14,476,000 weeks lost on an average each year in England and Wales by 14,000,000 insured persons," a little over a week by each worker. Quinby of the Hood Rubber Company reports that their 6,700 factory workers lost 6.61 days per year, the men losing 5 days, the women 8.75. Price states that about 9 days per person is lost from illness among the 65,000 members of the garment workers union of New York City. Five of the stores of the Harvard Mercantile Health Work, situated in four different cities, with a combined population of 10,200, in 1923 lost 68,621 days or 6.72 days per person from illness and injury.

Conclusion: Sickness is a universal problem of industry, of commerce and, in fact, of the community. The common causes of illness are, first, the common cold, second, indigestion including constipation, and third, nervous, mental or emotional disturbances. Miscellaneous groups cause lesser amounts of lost time. If we consider these disease groups from the point of view of prevention, we can see that much of this illness might not occur if the individual had cared for his or her health with the best available knowledge. The problem, then, is to make the best available knowledge a part of everyone's equipment in life. The home is the habit forming place; the school is the most effective community organization to teach; and the school girl, the future mother, is the most profitable pupil to teach, and later to apply that health knowledge to her children. The industrial age is too late to teach and train effectively health habits and health wisdom. Industry's part is to evaluate its new people; to supplement their knowledge; to give incentives to healthful living and continuous occupation; and to conserve energy, prolonging earning capacity.—Arthur B. Emmons, *The Commonhealth*, Mass. Dept. of Pub. Health, XI, No. 2:28 (Apr.–May–June), 1924.

Freak Dress Ideas.—Two curious anomalies of dress are observed among the women workers in steam laundries. Both of these are more or less unsatisfactory attempts on the part of these women to adapt themselves to the two most difficult features of their work, namely: the abnormal atmospheric conditions which prevail, and the long hours of standing. A great many of the girls are seen to wear sweaters in all but the very hottest seasons of the year despite the fact that the temperatures of the rooms in which they work are very hot. They do this because they are peculiarly sensitive to drafts. And yet drafts cannot be eliminated so long as windows and doors must be called upon to assist in the general ventilation of the workrooms. The wearing of sweaters in an already overheated room is, of course, contrary to every sound principle of physiology and general hygiene. Experience has shown that the maintenance of improper atmospheric conditions is in no sense inherent in the laundry industry, and can for the most part be eliminated. The wearing of carpet or felt bedroom slippers is surprisingly common in the industry, and is a real confession of how great a strain the long hours of standing appear to be. Here again the attempt at adaptation is an unfortunate one. It is obvious that these workers cannot make the various adjustments which are required for the maintenance of good health without expert assistance. The opportunities of the new Division of Industrial Hygiene with its hygienists, physicians, engineers, chemists, etc., to remedy such conditions is plain.—May R. Mayers, *Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, I, No. 3 (Sept.), 1924.

Industrial Arbitration Court Rules on the Hygienic Conduct of an Industry.—The first award on record in Australia where regulations governing the conduct of an industry as regards hygienic precautions has recently been made. After taking of evidence in the printing trade, a rather complete examination was made of the health of workers in six printing shops, three of which were nominated by the employers and three by the unions, the conditions of the air in these shops being also examined. Professor H. G. Chapman with Dr. S. A. Smith were given an absolutely free hand to report on the industry, with Dr. Wall, representing the unions, present at most of the examinations. In all one hundred and fifteen men were medically examined. "Professor Chapman stated that the results of these examinations evidenced no signs of any specific risk in the printing trade. In no case was a lead line found, nor was the presence of lead detected in the fifty-seven specimens of urine examined. Among the one hundred and fifteen men examined no signs of tuberculosis were detected. These findings are very remarkable in view of the fact that the experience in other countries has been such as to make it considered that the printing trade was unhealthy beyond the average, especially in regard to lead poisoning and the prevalence of tuberculosis." "The question as to the significance of the absence of lead from the urine was argued at length. Professor Chapman and Dr. Smith both held the opinion that if a trace of lead is not found in the urine no lead absorption can be going on." It was stated that in a similar investigation at Broken Hill, the largest amount of lead recovered from a cadaver was about 20 milligrams. It was shown, however, that the skeleton had not been examined and that researches conducted recently at Harvard Uni-

versity showed that over 80 per cent of lead stored in the body is held in the skeleton. Air samples were taken in two of the shops by Dr. Smith, who found that in the majority of instances no lead was detected in the atmosphere. None was detected over the linotypes, only a minute trace over the monotype, but a small amount was found while a room was being swept and the type boxes dusted. Evidence appeared to show that exhaust systems may stir up dust if the current is too strong and that an air current of not over 40 ft. a minute is optimum.

The award by the court, after the usual permissible exceptions, found as follows: (1) The ordinary working hours in the printing shop shall be 44 per week; (2) shops must be so constructed and ventilated by natural or artificial means as to insure that the atmosphere of the workroom shall contain less than one-tenth of a milligram of lead to 10 cu. meters of air, except that in the immediate neighborhood of a melting pot of a machine the air shall not contain more than one-half of a milligram of lead to 10 cu. meters of air; (3) stereotypes, linotypes, and monotype machines, and the melting of metal in bulk, shall be in a separate room; (4) all metal pots, unless electrically heated, shall be provided with hoods, so fitted that fumes and heavy gases shall be conducted into the open air; (5), (6), and (7) refer to the frequency and method of cleaning type cases, machines, and floors; (8) the employer must provide one wash basin for every ten employees with a sufficient supply of hot water and soap; (9) refers to provisions by the employer for keeping clothing; (10) the medical officer for industrial hygiene of the Department of Public Health may, at all reasonable times, enter the premises for the purpose of ascertaining whether these conditions are being observed and, (11) specified notices containing advice for the preservation of health of workmen shall be prominently displayed in all workrooms.—*Health*, Dept. of Public Health, Australia, II, No. 4 (July), 1924.

The Kata Thermometer.—The authors give the history and development of the Kata thermometer as well as a description of the instrument, its manipulation, and the fundamental laws underlying its phenomena. Other types of similar instruments are briefly discussed. The authors give the results of careful research work carried on at the Pittsburgh Experiment Station of the U. S. Bureau of Mines in investigating this instrument. They conclude that the Kata thermometer stands in need of much more experimentation. Using human subjects, they were able to establish a composite index of comfort for still-air conditions, called "effective temperature index." It was found that several combinations of high temperatures and low humidities were sensibly and physiologically equivalent to other combinations of comparatively lower temperature and higher humidity; hence though a person feels equally hot or equally cold under all equivalent conditions, Kata thermometer observations will vary radically under the same conditions, depending on the dry bulb temperature alone when dry kata observations are made and on the wet bulb temperature when wet kata observations are made. Furthermore, the relative importance of the wet- and dry-bulb temperature as affecting human comfort was found to vary with temperature. At 32° the dry-bulb temperature was found to be the only index of comfort, while at about 132° the wet-bulb temperature constituted such an index, regardless of dry bulb. At ordinary temperatures the two temperatures were of equal importance.—McConnel and Yaglaglou, *U. S. Pub. Health Reports*, 39, No. 36:2292 (Sept. 5), 1924.

A Difficult Problem Solved.—Vogt shows in an illustrated article how it was possible to devise an exhaust system of satisfactory type for a plant using grinding wheels where grinding was performed on the top surface of the wheel, also on the lower portion, and occasionally on the sides of the wheel. Different sized wheels with varying diameters and widths are also interchanged on a common spindle in the grinding frame.—John Vogt, *Ind. Hyg. Bull.*, N. Y. State Dept. of Labor, I, No. 2 (Aug.), 1924.

Initiative in Industrial Health Work.—While progress in industrial hygiene is to a considerable degree due to the work of state agencies, the results accomplished by industry itself through its employment of safety engineers, industrial physicians and nurses, have been of much greater significance. There is no doubt, however, that one type of official legislation, namely, the Workmen's Compensation Acts, have been largely responsible for the development of industrial medicine under

private auspices. The value of a good industrial code and an expert state inspectorate is not to be underestimated in that "the recalcitrant employer must be dealt with by legal pressure and the small employer must depend upon the state for advice and assistance in the solution of his technical problems."—Editorial, *Nation's Health*, 4, No. 7:472 (July), 1924.

Aims of Division of Industrial Hygiene.—The Division of Industrial Hygiene of the New York State Dept. of Labor, has recently been reorganized and expanded. The present personnel includes trained medical inspectors of factories, chemists, chemical and mechanical engineers, expert designers of protection devices for machinery and men trained in the problems of lighting and ventilating. While there has been a vast amount of research work done on hygienic and medical problems in the industrial field by highly qualified specialists, the application of the knowledge thus gained should be made only by highly qualified medical inspectors of factories. Such inspectors must be developed. Such physicians can be found, but they must be trained in practical factory work. "The principal functions of a medical inspector of factories in the New York State Dept. of Labor are: (1) The investigation of complaints made by factory inspectors and others relative to conditions in factories which fail to comply with the requirements of the New York State Labor Law; (2) making written and detailed reports of all investigations, and recommendations whereby the unhygienic or dangerous conditions found can be corrected or eliminated; (3) the investigation of dangerous trades and physical examinations of workers employed therein, to determine the effect on the health of the workers; (4) the investigation of industrial diseases reported by private physicians, hospital physicians and factories, and (5) the supervision of child labor in factories and mercantile establishments.

Diagnosis of conditions from which the worker is suffering is to be made by the inspector, by both clinical and laboratory means; and he is also to establish the fact that the worker developed the condition in the factory. Although the duties of the medical inspector and the inspector of the Factory Inspection Division are to be differentiated, their functions may be frequently combined to obtain results contemplated by the New York State Labor Law. In the field of research more remains to be accomplished in studying the relation of improper ventilation, noise and odors to industrial output. Employment periods and rest pauses should be adjusted until something approaching a reasonable and commonsense standard is attained. The field of study includes physical examinations, ventilation, heating, lighting, noise and vibrations, relief of workers, posture, protective apparatus against dust and fumes for workers, and safety devices.—L. E. Cofer, *Jour. A. M. A.*, 83, No. 4:257 (July 26), 1924.

Report of Committee on Benzol Poisoning.—A committee consisting of seven members, with Dr. C.-E. A. Winslow as chairman, was appointed by the National Safety Congress to make a study of the health hazards of benzol in industry. A report was made to the 12th Annual Meeting at Buffalo, October 1-5, 1923. A questionnaire was sent by the committee to 324 industrial establishments, which from the nature of their products might be expected to use benzol. Of 140 replies received, 84 firms reported that they used benzol, the amounts varying from an insignificant quantity to that of 30,000 gallons per week. A number of replies are quoted which detail the difficulties experienced in regard to benzol poisoning and special precautions used by the firms in attempting to minimize the hazard. Although the report is termed "preliminary," it is really a very interesting dissertation on the subject. It takes up the subjects of source, industrial uses and kinds of benzol, susceptibility, absorption, action, post-mortem pathology, and symptoms, diagnosis and treatment of poisoning. A list of tentative recommendations for precautionary measures is appended.—*Monthly Labor Review*, 18, No. 5:188 (May), 1924.

FOOD AND DRUGS

C. L. ALSBERG, M.D., AND D. B. DILL

Insulin.—The fact that insulin is destroyed by pepsin and trypsin suggests that it is a protein. Possibly, however, it is only adherent to protein. This view is supported by the fact that on several occasions it has been impossible to obtain a biuret reaction in highly potent preparations of insulin. Whether it is really a protein or not, it is significant that all methods now used for its purification are based on reactions which are characteristic for colloids. Typical insulin should exhibit the following physiological properties: when administered to normal animals it should cause immediate reduction of the blood sugar, and when hypoglycemic symptoms supervene, these should be immediately and permanently removable by injections of glucose. When administered to diabetic (depancreatized) animals, the symptoms hyperglycemia, glucosuria, acetonuria should immediately disappear and the general condition should improve; and when carbohydrate is also given, the respiratory quotient should rise decidedly and glycogen should be deposited in the liver.—J. J. R. MacLeod, *Physiol. Rev.*, 4, 21–68 (1924); *Chem. Absts.*, 18, 2531.

Properties and Preparation of Insulin, with Special Reference to the Picrate-Acetone Method of Preparation.—Insulin is freely soluble in glacial acetic acid, phenol, formamide and paraldehyde. Insulin forms a picrate which is easily soluble in moist acetone in 70 per cent concentration. As protein picrates are insoluble in moist acetone, this affords a simple means of separating insulin from associated proteins. The picrate acetone method of preparing insulin is described in detail.—E. C. Dodds and F. Dickens, *Brit. J. Exp. Path.*, 5, 115–22; *Chem. Absts.*, 18, 2351–2 (1924).

Animal Nutrition. IV. Nitrogen, Ash and Phosphorus Distribution in Beef Flesh as Affected by Age and Condition.—Extensive analyses are given of the flesh of beef animals in different planes of nutrition.—W. S. Ritchie, C. R. Moulton, P. F. Trowbridge and L. D. Haigh, Univ. of Missouri Agr. Exp. Sta. *Res. Bull.*, 59 (1923).

Formation and Accumulation of Urea in Mushrooms.—During ripening, and up to the time of spore formation in the fruiting body autolytic processes occur which result in amino acid formation. These are transformed into urea which may reach 13 per cent of the dry weight or about 50 per cent of the total nitrogen of the mushroom. This high urea content is ascribed to the rich nitrogen supply of artificial cultivation. Treatment with chloroform arrests the autolytic process in the amino acid stage, and urea does not then accumulate.—N. N. Ivanov, *Biochem. Z.*, 143, 62–74 (1923); *Chem. Absts.*, 18, 2362 (1924).

Tin Hydride from Using Rusty Tin Plate.—Poisoning from eating food packed in tin cans had been ascribed to the formation of arsene, but the author suggests that it may have been due to tin hydride. It was experimentally demonstrated that heating rusty tin plate with dilute acetic or oxalic acids produced tin hydride together with other gases. With pure tin the effect was much less marked. Ingestion of solutions of tin hydride may have caused the poisoning, even though no ill effects were noted in breathing laboratory air in which tin hydride was present.—Wilhelm Vaubel, *Chem. Ztg.*, 48, 351 (1924); *Chem. Absts.*, 18, 2390 (1924).

Importance of Fat in Animal Feeding.—The importance of the fat in rations of farm animals is emphasized, and the ratio between the fat and protein, called the adipo-protein ratio is discussed for the different classes of animals of varying ages. The adipo-protein ratios of different milks is given, and this is taken as a standard for the rations of young animals. A calf fed on whole milk and cream made better and more economical growth as determined by the organic substance consumed for kilogram of growth than other calves fed on skim milk or skim milk and whole milk. It is suggested that the fat aids in the economical utilization of the other constituents of the ration and in the destruction of toxic proteins aside from its actual food value.—E. Letard, *Rev. Zootech.*, 2, 292–303 (1923); *Exp. Sta. Record*, 50, 267; *Chem. Absts.*, 18, 2363.

Poisoning by **Red Paprika Containing Lead.**—Owing to the scarcity of paprika in Bulgaria and the wide use of it, the product has been extensively adulterated by the addition of 20 to 40 per cent corn meal, sometimes sawdust and bran and a residue remaining from the removal of oil from sunflower seed. It was difficult to find a coloring material suitable when sunflower seed was present; aniline dye was unsatisfactory, ochre was tried, and finally red lead. One thousand cases of lead poisoning developed in a city of 20,000 before the cause was discovered. Two samples of paprika contained 20.0 per cent and 20.1 per cent red lead.—M. Nicoloff, *Z. Nahr. Genussm.*, 47, 269-70 (1924); *Chem. Absts.*, 18, 2566.

Cultivation of **Molds on Amino Acids.**—Culture of *Aspergillus orhizae* or of *Sterigmatocystis nigra* were made on glycine, alanine, valine, and leucine. The gross energy yield in the growth of these molds was independent of the amino acid used in the culture. Similar results were obtained with glycosamine hydrochloride, but in a medium consisting of glucose and ammonium chloride the gross energy was increased 46 per cent. It is concluded that the loss of energy observed during the transformation of proteins to carbohydrates lies in the deamination, and that in this deamination is to be found the cause of the specific dynamic action of the proteins.—E. F. Terroine, (Mlle.) S. Trautmann, R. Bonnet and R. Jacquot, *Compt. rend.*, 178, 1488-91; *Chem. Absts.*, 18, 2349 (1924).

The More **Common Impurities of Anesthetic Ether.**—Simple tests for the examination of anesthetic ether are briefly described. One hundred ethers were subjected to these tests and thirty-four of these were found to be seriously contaminated. Peroxide and aldehyde are the chief contaminants, the former sharply predominating. The probability of oxidative changes subsequent to preparation as the causative factor is suggested, and evidence is offered that the time of storage is a factor in determining oxidation. The exclusion of water, alcohol and air from the container is suggested as a means of preventing oxidative changes during storage. Some evidence is presented indicating that ether may be stored in amber bottles for years without decomposition.—A. W. Rowe, *Ind. Eng. Chem.*, 16, 896-7 (1924).

Vitamin Potency of Cod-liver Oils.—Three liver oils were prepared from the same lot of livers, one from freshly rendered livers, the second from livers rotted four months and the third from livers rotted eight months. The figures for specific gravity, refractive index and saponification value increased as the rotting process proceeded, while at the same time the iodine value was materially lowered. There was also a notable formation of free fatty acids, these increasing from 1.3 per cent to 14.9 per cent in four months and to 23.3 per cent in eight months. Feeding experiments established the fact that fish liver oils produced by the rotting process have less growth promoting vitamin than oils produced from fresh livers. This conclusion is in accordance with the generally accepted belief of cod-liver oil manufacturers that the highest grade of cod-liver oil is obtained when strictly fresh livers are promptly rendered under carefully controlled conditions.—Arthur D Holmes, *Ind. Eng. Chem.*, 16, 964-5 (1924).

CHILD HYGIENE

TALIAFERRO CLARK, M.D.

Nutrition, Growth and Dentition.—The loss of lower deciduous teeth precedes that of the upper by an average of about seven months. An exception to this occurs in the shedding of the deciduous molars of well nourished boys on an average of about two months before the lower.

The girls shed their deciduous teeth on an average of four and one-half months earlier than the boys, with an exception of a negligible, slight difference in shedding the lower incisors and the first molars of undernourished girls.

Undernourished children shed all the incisors and lower canines later, and the upper canine, and all the molars in boys, earlier than do well nourished children. The shedding of the molars and the upper canines is retarded in well nourished children.

Although the shedding of the deciduous teeth begins later in undernourished children, they complete the process about a half year earlier.

Although most of the lower permanent teeth precede the upper at an average of about nine months, there are exceptions:

(1) The upper pre-molars, excepting the second pre-molars in well nourished boys, are erupted before the lower pre-molars.
(2) While the incisors, canines, and lower pre-molars of the undernourished erupt at an average of about two months later, the upper pre-molars and all the molars erupt at an average of about one-half year earlier than those in the well nourished boys.

The undernourished girls show a greater retardation in the incisors, lower first pre-molars and upper molars but are accelerated in the canines, upper pre-molars, lower second pre-molars, lower first molars, and upper and lower second molars.

Of the group of children studied, the well nourished children, though accelerated in body growth are retarded in dentition as compared with the undernourished children. This may be due to the care which the teeth receive, or to the excessive demand upon the energy required for growth in general.—Milo Hellman, *The Dental Cosmos* (Jan.), 1923.

Thumb Sucking.—The influence of thumb sucking or of the use of the pacifier upon the shape of the jaw and the set of the teeth is purely mechanical. The effects depend largely upon the length of time this habit is practiced and on the amount of the pressure exercised upon the jaw or upon the teeth themselves. A certain amount of deformity undoubtedly sometimes results, such as malposed and protruding teeth. A small muslin bag or perforated aluminum balls drawn over the hands and attached to the gown or sleeves is very effective in the treatment of this habit. It is not necessary to resort to distasteful solutions upon the thumb and the fingers.—*Abt's Pediatrics.*

Foster Home Care for Dependent Children.—The growing emphasis during the past decade upon the need of home care for the normal child has resulted in the effort, first, to prevent the break-up of the child's own home by giving "mother's pensions," or public aid to children in their own homes, and second, to find a substitute home for homeless children. At the present time forty-two states give public aid to dependent children in their own homes, and the number of children in foster homes has increased substantially. The number of children in institutions has proportionately to the child population decreased.

Tentative figures place the number of children aided in their own homes at 127,000, the number of children in foster homes at 70,000, and the number in institutions 125,000.—Foster Home Care for Dependent Children, Children's Bureau, U. S. Department of Labor, 1924.

Iron in the Infant's Diet.—Egg yolk, spinach, prune sauce, and beef juice are the most valuable foods in respect of iron and pigment content. They do not upset infants when given in reasonable amounts. Egg yolk is the best of all of these foods. It contains iron in a larger amount, pigment in large quantity, and considerable caloric value, is antirachitic, and is easy to digest.

Egg yolk may be given at the sixth month to normal feeding cases. Egg idiosyncrasy,

when it exists, is more likely to be due to egg white than to egg yolk. In feeding the egg, it is hard boiled, separated from the white, and is finely grated. Beginning with about a teaspoonful moistened with a little milk, in the course of a few days the half of a yolk is given, and by the ninth month the whole yolk. If egg yolk is used, there is no need for spinach or beef juice. However, egg yolk may be given one day, and spinach with beef juice on the next day in order to vary the diet. A baby one year or under should not take more than a tablespoonful. It must also be remembered that spinach is given for a definite purpose, and that only a small amount is needed for this purpose.

Finely strained prune juice is a good addition to the diet and contains a large amount of iron. A tablespoonful a day is enough to give a child at twelve months.—By Lewis Webb Hill, M.D., *Boston M. & S. Jour.*, August 21, 1924.

Prognosis of **Tuberculosis in Infancy.**—Fourteen per cent of febrile conditions in infants diagnosed as influenza gave a positive Pirquet reaction. It is possible that many other fevers of obscure origin in infants, children and adults are due to a reaction of the body to tuberculous infection.

The tuberculin reaction should be carried out on every infant who has an obscure fever without physical signs.

In a series of 64 children under observation for longer or shorter periods of time infected during the first year, 39 died, 21 are alive, and 4 were lost track of—a mortality of 68 per cent. Oswald cites a mortality of 59.15 per cent in lung and bronchial gland tuberculosis. The mortality of 40 children observed by Frankenau during the second half of the first year was 60.3 per cent; and Fischl reports a mortality of 58.8 per cent. The prevailing opinion at present is that the prognosis of tuberculosis in infancy is not so grave as it was formerly thought. The younger the infant the worse the prognosis. The severity and course of the infection depend on, (1) the dosage of infection and resistance of the body, (2) the weight of the child, (3) whether breast fed or artificial, (4) hygienic surroundings.—Mark S. Reuben and Alonzo DeG. Smith, *Arch. of Ped.*, August, 1924.

Average Duration in Years of the Teething Period.—A. Length of Period from the Loss of First Deciduous Tooth to the Eruption of Last Second Permanent Molar.

Group	Wealthy	Poor	Difference
Boys	6.40	6.04	—0.36
Girls	6.15	5.76	—0.39
Difference	—0.25	—0.29	. . . . .

B. Length of Period of Shedding the Deciduous Teeth.

Group	Wealthy	Poor	Difference
Boys	5.21	4.66	—0.55
Girls	4.91	4.23	—0.68
Difference	—0.30	—0.43	. . . . .

C. Length of Period of Erupting the Permanent Teeth.

Group	Wealthy	Poor	Difference
Boys	6.36	6.34	—0.02
Girls	6.43	6.08	—0.35
Difference	—0.07	—0.26	. . . . .

—By Milo Hellman, D.D.S., *The Dental Cosmos*, Vol. LXV, No. 1 (Jan.), 1923, p. 34.

Preventive Work Among Children from One to Five Years of Age.—In the year 1922 there were 4,704 live births in the Borough of St. Pancras, London; 337 children died under one year of age (infantile mortality rate of 74); and 281 children died between the ages of 1 and 5 years.

Of the 281 deaths, 83 were due to diseases of the respiratory system and 165 to general diseases.

About 50 per cent of the children attended the clinics in this borough. Excluding the children who died before the age of one month, there were 52 deaths among children who attended centers—32 aged 1 to 12 months; and 20 aged 1 to 5 years.

There were 78 deaths among children who did not attend centers—40 aged 1 to 12 months; and 38 from 1 to 5 years—nearly twice as many as those who attended.

In a study of infectious diseases conveyed to younger brothers and sisters in the family by children attending school, an analysis of 100 cases of measles occurring in children under 5 years of age in 1924 shows that 24 children from 3 to 5 years attended the London County Council School, 26 cases of contact were school children, 4 contacts in hospital wards, 4 attended creches, 14 had attended welfare centers, and the source of infection was not traced in 28.

Prevention of these infections may be materially assisted by: (a) better housing, and the isolation of the measles and whooping cough patients, and (b) less overcrowding in the schools.

With regard to the prevention of bronchitis and other respiratory diseases, special clinics for "toddlers" are of much benefit in giving advice, (a) on the kind of diet, (b) encouraging nasal breathing and the removal of all causes of nasal obstruction, (c) regarding the kind and amount of clothing, (d) emphasizing the necessity for exercise in the open air, and sun light.—Stella Churchill, M.R.C.S., L.R.C.O., D.P.H., *The Med. Off.*, August 9, 1924, p. 65.

Value of Maternity Homes.—"The majority of infant deaths occur in the first month of life, and it is to adequate ante-natal supervision and maternity home facilities that we must look for further reduction in our infant mortality. Serious midwifery operations are undertaken in private houses often under such adverse conditions that no doctor would dream of performing other surgical operations of less severity. Apart from the chance of loss of life, and still greater chance of loss of health to the woman, the result is too frequently the birth of a dead or weakly infant. With the growth of maternity hospital accommodation, it is to be hoped that in the near future women will have the right to have such operations performed in as ideal conditions as would any other surgical operation be carried out, and with the growth of ante-natal work these operations will be reduced to a minimum."—Dr. A. H. G. Burton, *The Med. Off.*, August 9, 1924, p. 71.

Estimation of Foetal Age.—The records of 1,000 post mortem examinations of new-born infants, collected in the course of the routine work of the Research Department of the Glasgow Royal Maternity and Women's Hospital, were studied together with clinical records of the cases. Of this number 530 were considered abnormal cases and were removed from the series, namely, macerated foetuses, monsters, infants delivered after craniotomy or any other destructive operation, and infants which survived their birth for more than one day. The stage of development of the remaining 470 cases considered normal was calculated according to four separate methods.

(1) Maternal menstrual history (available for for only 214 cases in a reliable form).
(2) State of ossification (using the standard of Ballantyne).
(3) Body weight (using the standard of Ballantyne).
(4) Body length (using the standard of Ballantyne).

The percentage of cases in all age groups in which the various methods of classification agree is as follows:

1. The age of the foetus as calculated by the menstrual history agreed with that calculated from the state of ossification in 64 per cent (of 214 cases).

2. The age of the foetus as calculated from the menstrual history agreed with that calculated from the body weight in 57 per cent (of 214 cases).

3. The age of the foetus as calculated from the menstrual history agreed with that calculated from the body length in 65 per cent (of 214 cases).

4. The age of the foetus as calculated from the state of ossification agreed with that calculated from the body weight in 66 per cent (of 470 cases).

5. The age of the foetus as calculated from the state of ossification agreed with that calculated from the body length in 78 per cent (of 470 cases).

6. The age of the foetus as calculated from the body weight agreed with that calculated from the body length in 56 per cent (of 470 cases).

As a general conclusion no one method or combination of methods of estimating foetal age was found to be accurate in all cases. However, in the absence of reliable menstrual history, the best method to employ is a combination of body length and observation of the state of ossification. The value of body length as compared with body weight in estimating foetal age is relatively greater.—The Estimation of Foetal Age, the Weight and Length of Normal Foetuses, and the Weights of Foetal Organs, *British Med. Res. Council*, London, 1924.

Lactic Acid Milk in Feeding Infants.—Lactic acid milk may be given to premature infants, vigorous babies, athreptic babies, the vomiters, and infants ill with diarrhea or an acute infectious disease. It is apparently well

digested and seems to give uniformly excellent results when fed to healthy or sick infants up to one year of age.

Lactic acid milk is better suited to the needs of infants than is sweet milk because: (1) The protein in acid milk is precipitated as a fine flocculent curd. (2) Its acid-binding qualities are similar to breast milk. The hydrogen-ion concentration of the gastric contents at the height of digestion of a group of infants fed on whole lactic acid milk was found to be 3.71 as compared with that of the stomach contents of the same group fed on breast milk, which was 3.75 and is probably an optimum concentration for gastric digestion for infants under one year. (3) It is practically sterile even under the most adverse conditions, or rather under the most favorable conditions for bacterial growth, other than the presence of lactic acid. (4) It has a maximum food value with a minimum of bulk.

It is prepared, with slight modification of the formula suggested by Marriott and Davidson, as follows:

To one quart of cool raw certified milk add slowly, drop by drop, 120 minims of lactic acid (U. S. P.), stirring constantly. Then add 2 ounces of blue label karo corn syrup, mixed with an equal quantity of water.

The majority of infants fed on this milk took 5 or 6 feedings in 24 hours at intervals of 4 hours between feedings.—A Clinical Study of Lactic Acid Milk as a Routine Feeding for Sick and Healthy Infants, Manning C. Field, *Arch. of Ped.*, August, 1924.

HEALTH EDUCATION AND PUBLICITY

EVART G. ROUTZAHN

Where to **Get Health Motion Pictures.**—An important service is continued through the publication of a fourth edition of "List of Health Films" by the National Health Council, 370 Seventh Ave., New York City. Price 35 cents. The pictures are grouped under Child Hygiene, Personal Hygiene, Physiology and Anatomy, Preventable Diseases, Public Health Nursing, Safety and First Aid, Sanitation, Miscellaneous. There are 32 subtopics. The Health Films Committee will review and criticize constructively any film on public health. The committee is also prepared to criticize scenarios and give information regarding the making of health films.

Care to **Join an Exchange?**—What material issued by other public or private agencies do you wish to see? Will you exchange your press material with any one who will send his press stories? Will you make a stencil for the other fellow, or put his name on the newspaper list so that he will receive your stories just as regularly as a newspaper editor? Will you send your monthly or weekly bulletin? your leaflets? your appeal letters? What do you wish, and what will you send to those who will do likewise? The editor of this department will be glad to clear such information among those who are interested.

Suggestions for Conference and Convention Programs.—If you have the chance to have publicity methods discussed in a health convention program, or to organize a state or local conference on the subject, you will find ready-made suggestions in the health education and publicity programs of the American Public Health Association at New York, Boston, Cleveland and Detroit. Then, too, the three programs of the Committee on Publicity Methods may prove suggestive. Copies of these programs will be sent upon request by the editor of this department.

To the Director of Health Education and Publicity.—The Health Education and Publicity Section of the A.P.H.A., together with this department in the JOURNAL, affords to health publicity workers an opportunity not granted to any other specialized group in the social welfare field. But for contacts and information touching publicity work in all social fields, the health worker may turn to the Committee on Publicity Methods in Social Work, 130 East 22d St., New York City. Health workers form the largest specialized group now affiliated with the committee. The committee issues a *News Bulletin* presenting news and suggestions not covered by this department.

Five Points on Fair Exhibits.—1. Visitors at exhibitions give very little attention indeed to material displayed on the wall in the form of statistical charts, small photographs, reading matter, or anything else which requires careful examination. 2. Material presented in the form of a demonstration, in which some one who speaks well explains something that she or he may be doing to a group of persons who gather at the booth is most successful. 3. Next to this comes the personal explanation by a well qualified attendant of a model displayed in the center and at the front of the booth or of articles shown on tables. 4. If there is any material on the walls, it would be best to have it take the form of posters on which there is one large picture and not more than twenty-five words. 5. It is on the whole wasteful to give out printed matter at exhibits unless it deals with the same subject which is described in the exhibit, and unless also the persons who receive it have already shown an interest in what is displayed or in what they have been told by the attendant.

A New Health Game.—Red, white and blue kites, balloons and boats and a thrilling race track used in a delightful poster game or project for children are shown and described in "Projects in Poster Making," by Juliet Bell of the Michigan Department of Health.—*Michigan Public Health*, Lansing, pp. 197–206 (June), 1924. 8 illus.

Many Will Listen in on These Radio Talks.—Some radio talks, much better than the average, are published in "Radio Talks on Women in Industry." At least two of the talks definitely relate to health matters: "Health and Hygiene for Women at Work," and "Posture and Seating." The type of illustrations included in the pamphlet will prove suggestive for annual reports or other publications. If you cannot secure a free copy from the Women's Bureau, Washington, D. C., send ten cents to Superintendent of Documents, Washington, D. C.

A New National Center for Mouth Hygiene Educational Work.—Miss Evelyn C. Schmidt, formerly with the Massachusetts State Department of Health, is director of a new Department of Dental Health Education, American Dental Association, 5 North Wabash Ave., Chicago, Ill. The department "plans to be a service station for professional, educational and public health groups by assembling and distributing authoritative educational material on dental health." A tentative program was outlined in the September, 1924, issue of the *Journal of the American Dental Association*.

A Well Designed Convention Program.—If you are planning to print a convention program you may get some ideas for its form and content by asking the National Housing Association, 105 East 22d St., New York City, to send you a copy of "You Can't Afford to Miss It." It is illustrated with photographs of speakers and very short paragraphs about them. Its size, shape and the layout are conveniently planned for use.

Are There Popular Health Magazines in the Libraries and Reading Rooms?—Is it not worth while to check up the health magazines available in local reading rooms and libraries? Look up the public, school and club libraries. If the offerings are inadequate and the managements will not make additions, there may be some interested citizen who will gladly provide the subscription cost. Incidentally, the public library, at least, should receive the AMERICAN JOURNAL OF PUBLIC HEALTH. The more alert school librarians also will appreciate the Child Hygiene and Health Education and Publicity departments of the JOURNAL.

Health Stencils.—Stencils for producing outline pictures on blackboards or for designing posters are now available through March Brothers, Lebanon, Ohio, at ten cents each. The subjects include "Drink Milk," "Friends and Enemies of Good Health," "The Fruit Family," "Good Health Cherubs," "Toothbrush Brigade," "Underweight or Overweight," and "The Vegetable Family." Some subjects are 36 by 24 inches; others are 40 by 30 inches in size.

Hiking for Health. — Readers of the JOURNAL may find opportunities for utilizing the interest in hiking clubs as an indirect health agency. A suggestive sample of a hiking club program will be supplied by the editor of this department, who is chairman of the New York Chapter, Adirondack Mountain Club.

PUBLIC HEALTH LEGISLATION

JAMES A. TOBEY, LL.B.

Fads in Health Legislation.—Some of the idiosyncracies of health legislation are sardonically set forth in an article in the *American Mercury* for September, 1924. The author, Dr. Morris Fishbein, acting editor of the *Journal of the American Medical Association*, animadverts as follows: "In no field of human activity do the laws present such a bewildering maze of fact and fallacy, of the unenforceable and the unobeyable, as in that of public health," and he then proceeds by example and quotation to demonstrate how "asinine and ridiculous" some of them are (in his opinion).

Beginning with a resolution passed in 1832 by the Washington Board of Health to cope with cholera, which prohibited the use of all green vegetables but censured any restriction on commerce, the author next comments caustically on a 1916 regulation of Colorado which requires cuspidors in food establishments to be cleansed daily. He believes the spittoon to be an invitation to spit. Certain barber shop rules in Colorado, some soda-fountain regulations in Alabama, and an Arizona law requiring midwives to endeavor to secure the assistance of a physician if the child is not born after 24 hours of labor, then come in for scorn as meaningless.

Various elaborate rules for coping with influenza are decried by Dr. Fishbein because not enough is known about the disease to warrant legislation based on scientific grounds. So-called hotel sanitation laws in North Dakota and Texas, which deal with the length and periodical changing of sheets have a little fun poked at them by the author. The recent Virginia law which is aimed to prevent pollution of the white race of that commonwealth with Negro blood, or vice-versa, receives the comment that there is no "certain method of determining when Negro blood is present in a person." Practice of medicine acts and venereal disease legislation have some acrid remarks cast at them. With regard to the latter, the author believes that the problem is purely an educational and medical matter and not a legislative one, anyway. "Certainly," he says, "the burden of proof is on the legislators and their advisers that their restrictive and regulatory measures have accomplished anything."

The article closes with a few splenetic remarks on the Sheppard-Towner Act, without which no paper by anyone connected with the American Medical Association is ever complete. "Now the legislation promised has been enacted," he writes, "and practically all the states have made the individual appropriations required—and yet, after three years, the maternal death-rate has not been appreciably affected."

Dr. Fishbein's cited fads are interesting and his paper contains much food for thought, some of it likely to cause indigestion. It is unfortunate that he missed one gem, accredited to Massachusetts by A. C. York in a recent article in the *Commonhealth*. This municipal ordinance states that, "Any person who owns or occupies property abutting on a public sewer shall be connected with the same under penalty for neglect to do so of a fine not to exceed one hundred dollars." That improvement in health laws in this country is possible and needed will be granted by any sanitarian who has studied the subject. Strange as it may seem to Dr. Fishbein, however, there are actually quite a number of laws on health which are excellent.

Incidentally, the same number of the *American Mercury* contains a review of the National Health Series. After a few complimentary remarks on most of the books, the reviewer spends several pages telling how wrong the whole venereal disease movement is.

The Federal Maternity and Infancy Act.—The United States Children's Bureau has issued a pamphlet (Bureau Publication No. 137) describing the administration of the federal act for the Promotion of the Welfare and Hygiene of Maternity and Infancy, popularly called the "Sheppard-Towner Act," for the period March 20, 1922, to June 30, 1923. This booklet gives a summary of the law itself, funds available, list of states accepting, and a description of the administration of the act by them. The only states which had not accepted the Act in 1923 were Maine, Vermont,

Massachusetts, Connecticut, Rhode Island, Illinois, Louisiana, and Kansas, though Louisiana has since adopted it. Accomplishments are summarized as follows:

"Obviously it is too early, at the end of fifteen months' work, to measure definite achievements in such extensive programs as are covered by state-wide plans in maternal and infant hygiene, but the foregoing discussion of specific activities serves to indicate the work already well under way.

The general trend of activities may be summarized briefly as follows:

1. The education of the general public as to the need and value of skilled supervision during pregnancy and medical and nursing care during and following confinement.

2. Better infant care through the teaching of mothers.

3. Stimulation of the medical and nursing professions to meet the public demand for better health protection of mothers and infants, since the result of the activities now in progress must ultimately be the provision of adequate medical and nursing facilities as applied to the hygiene of maternity and infancy.

As a successful federal-aid measure the act has already demonstrated the value in that it has—

(1) Stimulated state activities in maternal and infant hygiene.

(2) Maintained the principle of local initiative and responsibility.

(3) Improved the quality of the work being done for mothers and babies by disseminating through a central source—the Federal Government—the results of scientific research and methods of work which have been found to operate successfully.

(4) Increased state appropriations with the passage of the act. From the appropriation for the fiscal year 1922, 15 states were able to accept only the $5,000 unmatched funds. Six states were able to accept only the $5,000 unmatched from the federal appropriation for the fiscal year 1923. However, all of the states coöperating under the act either have already accepted more than the $5,000 unmatched allotment from the 1924 federal appropriation, or will be able to do so."

The *Journal of the American Medical Association* for September 13, 1924, says a few things editorially about the last four items. These colorful remarks are as follows:

"Actually, the first three items just quoted mean nothing. They represent no scientific evaluation of results, but merely the general statement that more attention is being paid to the matter without evidence of paternalism. How is it demonstrated that this act, which is essentially paternalistic, has 'maintained the principle of local initiative and responsibility?' The fourth claim made means even less from the standpoint of benefit, since one of the chief charges against this act was that it forced the states to appropriate money in order that they might receive an equal share of federal funds. It is strange, then, that the claim should be made that one of the benefits of the act has been that the states have been forced to appropriate money which, by the very nature of things, they could hardly avoid appropriating. If the proponents of the Sheppard-Towner Act would justify the bill, they must submit exact figures indicating that the maternal and infant death rates have been appreciably lowered in those states which have coöperated with the Federal Government, and that the rates are much lower than those obtaining before this meddlesome legislation became effective, and lower also than those of the states which have not coöperated, and which may serve in this case as a control. Furthermore, recognition should be made of the tendency toward lowering of maternal and infant mortality rates in accordance with the general lowering of all mortality rates following increased application of our knowledge of sanitation and hygiene."

Homicide and the Law.—Homicide is a matter which not only affects mortality rates, but is a subject in which every good citizen should be interested. The present administration of criminal justice is admitted by most decent lawyers and sociologists to be a disgrace in the United States. The *Statistical Bulletin* of the Metropolitan Life Insurance Company for August, 1924, confirms this opinion by giving some interesting data. More than 9,000 homicides have occurred annually in this country, seventeen times the rates for England and Wales and six times that of Canada. The homicides committed in Chicago alone in 1922 (228) exceeded the number for that year in England and Wales (202). The Metropolitan has collected data on 146 homicides on which it paid policies and finds that of them, 32 were "justifiable," that is in line

of duty or self defense; of the remainder only 69, or about 60 per cent, were indicted. Of these 69, there were 11 no-trial cases, 16 of the 58 tried were acquitted; of 41 found guilty 35 are serving time, with 6 appeals pending, 2 are held for new trial, one was paroled, one fined, and one executed. Can anyone say that so-called criminal justice is a farce? When confessed murderers like Leopold and Loeb can get off with a life sentence, with the inevitable request for parole likely to come in due time, and Harry Thaw can go scot free after the lapse of a few years, something is wrong.

Plumbing and Health.—In the September issue we cast an aspersion on a court which rendered an opinion that plumbing regulations were made solely in the interests of public health. Any progressive sanitarian will readily agree that plumbing as a factor in public health is of relatively minor significance. When compared with such important matters as prevention of infant mortality, promotion of child hygiene, control of communicable diseases, collection of vital statistics, health examinations, and popular health instruction, it fades from view as a real factor. Of course, good plumbing is a distinct sanitary advance over an open privy, but bad plumbing will not cause diphtheria or any other disease.

The Bureau of Standards of U. S. Department of Commerce has just issued an excellent pamphlet containing recommended minimum requirements for plumbing in dwellings and similar buildings. These requirements are completely given and well worked out, and the book will be a valuable text for plumbers and of interest to sanitarians. In fact, members of the erudite profession of plumbing ought to be especially pleased, because the pamphlet seems to go out of its way to prove that plumbing is of considerable importance to human health, a view which is, of course, of economic value to plumbers. Leakage of sewage is cited as dangerous, as is also the possible entry of vermin through defective plumbing. Sewer air is called dangerous, no longer because it may contain bacteria, but on account of possible deleterious chemical substances, which act physiologically. The pamphlet states, "The Committee is of the opinion, therefore, that until further light on this somewhat obscure subject has been obtained the escape of sewer air from the house-drainage system, at frequent intervals or in considerable quantities, threatens the health of the building's occupants." And later, "The Committee believes that good plumbing is a matter which concerns health." An excellent outline of the legal principles is included in the discussion, but we think that the justification of them as an *important* health measure is over-stressed.

Nursing Legislation.—The proceedings of the twenty-fourth convention of the American Nurses Association, held in Detroit last June, contains reports of the committee on federal legislation and of a special committee on legislation. The latter suggests a good outline for a state nursing law. This applies, of course, to nurses in general and not specially to public health nurses. Control of licensing and administration is recommended to be placed in the State Department of Education. Control of training institutions by law is suggested and inspection of them should be adequate. A board of nurse examiners, consisting entirely of registered nurses should be appointed and minimum educational requirements for nurses are outlined. It is believed wiser to enforce a minimum standard of one or two years of high school, than a maximum of four years with many equivalents of little value. A permissive law is deemed better than a compulsory one, unless sufficient machinery can be supplied to enforce the latter. Adequate machinery in any event is necessary.

CONVENTIONS, CONFERENCES AND MEETINGS

This calendar is published through the coöperation of the National Health Council, 370 Seventh Avenue, New York City. The Council will be glad to answer promptly any written or telegraphic inquiries regarding meeting dates in order to avoid conflicts.

November 4-7, Texas Association of Sanitarians, Houston, Texas.

November 5, New York State Association of Public Health Laboratories, Albany, N. Y.

November 7-11, American Country Life Association, Columbus, Ohio.

November 10-12, National Municipal League, Cambridge, Mass.

November 10-14, American Dental Association, Dallas, Texas.

November 11-13, New York State Conference of Charities and Correction, Syracuse, N. Y.

November 13-15, Association of Military Surgeons of the U. S., San Antonio, Texas.

November 14-19, National Woman's Christian Temperance Union, Chicago, Ill.

November 19-22, American Social Hygiene Association, Cincinnati, Ohio.

November 24-27, Southern Medical Association, New Orleans, La.

December 4, National Dairy Council, Chicago, Ill.

December 4-6, Western Surgical Association, French Lick Springs, Ind.

December 5-6, Fiftieth Annual Session, New Jersey Sanitary Association, Atlantic City, N. J.

December 8-12, Radiological Society of North America, Kansas City, Mo.

December 9-11, Southern Surgical Association, Charleston, S. C.

December 11-13, National Society for Vocational Education, Indianapolis, Ind.

December 29-31, Society of American Bacteriologists, Washington, D. C.

December 29-31, American Physiological Society, Washington, D. C.

December 29-31, American Society of Biological Chemists, Washington, D. C.

December 29-31, American Association for Labor Legislation, Chicago, Ill.

December 29-January 3, American Association for the Advancement of Science, Washington, D. C.

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